City of Newport Beach
Newport Coast Watershed Management Plan

FINAL

Prepared For:

The City of Newport Beach
3300 Newport Boulevard
Newport Beach, CA 92663

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Prepared By:

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LIST OF ACRONYMS

AFY	Acre Foot per Year
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CCR	Critical Coastal Area
CRM	Coastal Resource Management
CSS	Coastal Sage Scrub
CTR	California Toxics Rule
DAMP	Drainage Area Management Plan
EPA	Environmental Protection Agency
FY	Financial Year
GRS	Groundwater Replenishment System
ICWMP	Integrated Coastal Watershed Management Plan
IRWMP	Integrated Regional Watershed Management Plan
LID	Low Impact Device Designs
MS4	Municipal Storm and Sanitary Sewer System
MUN	Municipal and Domestic Supply
MWD	Metropolitan Water District
NPDES	National Pollution Discharge Elimination System
OCWD	Orange County Sanitation District
REC-1	Contact Recreation Water
REC-2	Non-contact Recreation Water
RWQCB	Regional Water Quality Control Boards
SARWQCB	Santa Ana Regional Water Quality Control Board
SCUBA	Self-Contained Underwater Breathing Apparatus
SSO	Sanitary Sewer Overflow
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
UC Irvine	University of California Irvine
US	United States
URMP	Urban Runoff Management Plan
OCSD	Orange County Sanitation District
WARM	Warm Freshwater Habitat
WQO	Water Quality Objective
WMP	Watershed Management Plan
WMAC	Watershed Management Action Committee

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1.0 PURPOSE AND SCOPE OF THE WATERSHED MANAGEMENT PLAN

This section provides the framework used for the development of the Newport Coast Watershed Management Plan as well as insight into the State Water Board WMP framework and its application in this document. The WMP program management process is described in detail and provides insight into the community and stakeholder involvement, the development of planning processes and project prioritization and implementation. Finally, the adaptive management strategy section provides specific details of actions required after program implementation in order to effect positive change in key challenge areas.

1.1 Introduction

The City of Newport Beach (City) is committed to achieving a sustainable coastal watershed through protection and restoration activities that address community needs, regulatory requirements and the health and diversity of the coastal ecosystems. The City's strategy toward achieving this vision begins with an evaluation of the current health and quality of the watershed and identifying the sources of impacts to the watershed. Based on this understanding, strategies will be developed that protect the quality of the watershed followed by the implementation of restoration measures and supplemented by community outreach and education. The end goal is a sustainable watershed maintained through continued assessment of the effectiveness of the protection, preservation and restoration measures.

The WMP aims to guide the City and the watershed stakeholders in the implementation of activities that protect, enhance and restore the Newport Coast Watershed. The watershed stakeholders include government agencies, industry professionals, commercial businesses, private citizens, and environmental conservation groups that live, work, manage, recreate and have other interests within the watershed. The City and watershed stakeholders are represented by the Watershed Management Action Committee (WMAC).

The structure of the plan mimics frameworks used by the State Water Resources Control Board (SWRCB) for evaluating and scoring management plans (State Water Resources Control Board, 2007):

- Regional Description – including the watershed and the Areas of Biological Significance (ASBS);
- Objectives - identifies the goals of the WMP;
- Water management Strategies and Integration - provides an action plan of recommended strategies to meet these goals;
- Regional Priorities - prioritizes these actions based on regulatory, technical and financial criteria;
- Implementation
- Impacts and Benefits
- Technical Analysis and Plan Performance
- Data Management
- Financing
- Relation to Local Planning
- Stakeholder Involvement and Coordination
- Disadvantaged Communities

1.2 Project Methodology and Participants

Development of the WMP was adapted from the process model provided in the Environmental Protection Agency publication entitled, "A Hand Book for Developing Watershed Plans to Restore and Protect our Waters" (illustrated in Figure 1-1). The process included:

- Building and enhancing participation, collaboration, and partnerships
- Characterizing and assessing the conditions of the Newport watershed
- Setting goals and objectives and identifying issues and concerns
- Development of a WMP framework
- Completing the framework to create a WMP that includes an implementation plan

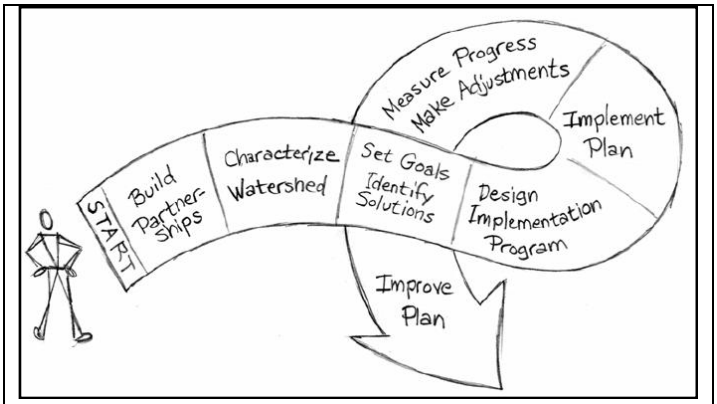

Figure 1-1: Example of EPA's Recommended WMP Process

Background information was gathered from numerous sources to identify watershed issues and concerns associated with water quality, ecology, and community planning in the Newport Coast Watershed. These issues and concerns served as the foundation for creating the goals and objectives that will guide the implementation of this WMP. Coordination with community associations, jurisdictional agencies and local environmental groups was an essential component in this process; as was identifying the critical issues and objectives for this watershed. Ultimately, the public involvement and coordination with all watershed stakeholders will be an integral driver for the successful implementation of this plan and any future revisions as watershed conditions improve through time.

Issues and concerns for the watershed were identified from the following sources of information and activities:

- A background study and watershed Existing Conditions Summary (Section 2.0)
- Santa Ana Regional Water Quality Control Board Basin Plan
- WMAC meetings
- Stakeholder Workshops
- Public Outreach

1.3 Program Management Process

This planning document provides the City and stakeholders with the framework to implement projects that will meet the watershed goal for creating an ecologically sound and sustainable watershed. Figure 1-2 presents an overview of the Newport Coast WMP development and implementation strategy to fulfill the watershed vision. Figure 1-1 shows the combination of prioritization and integration within the watershed and the planning area.

- Vision and goals: Vital to the success of the WMP is the full involvement of stakeholders to form a consensus on both vision and goals.
- Planning and integration: The outcomes of the consensus process are then used to determine objectives and form frameworks for multipurpose projects.
- Project development: Identified projects are developed in terms of schedule, costs and workplans.
- Project prioritization: Once projects have been identified, a prioritization process is developed which best implements appropriate projects within a defined schedule. Projects are then implemented in a phased manner depending on funding availability.

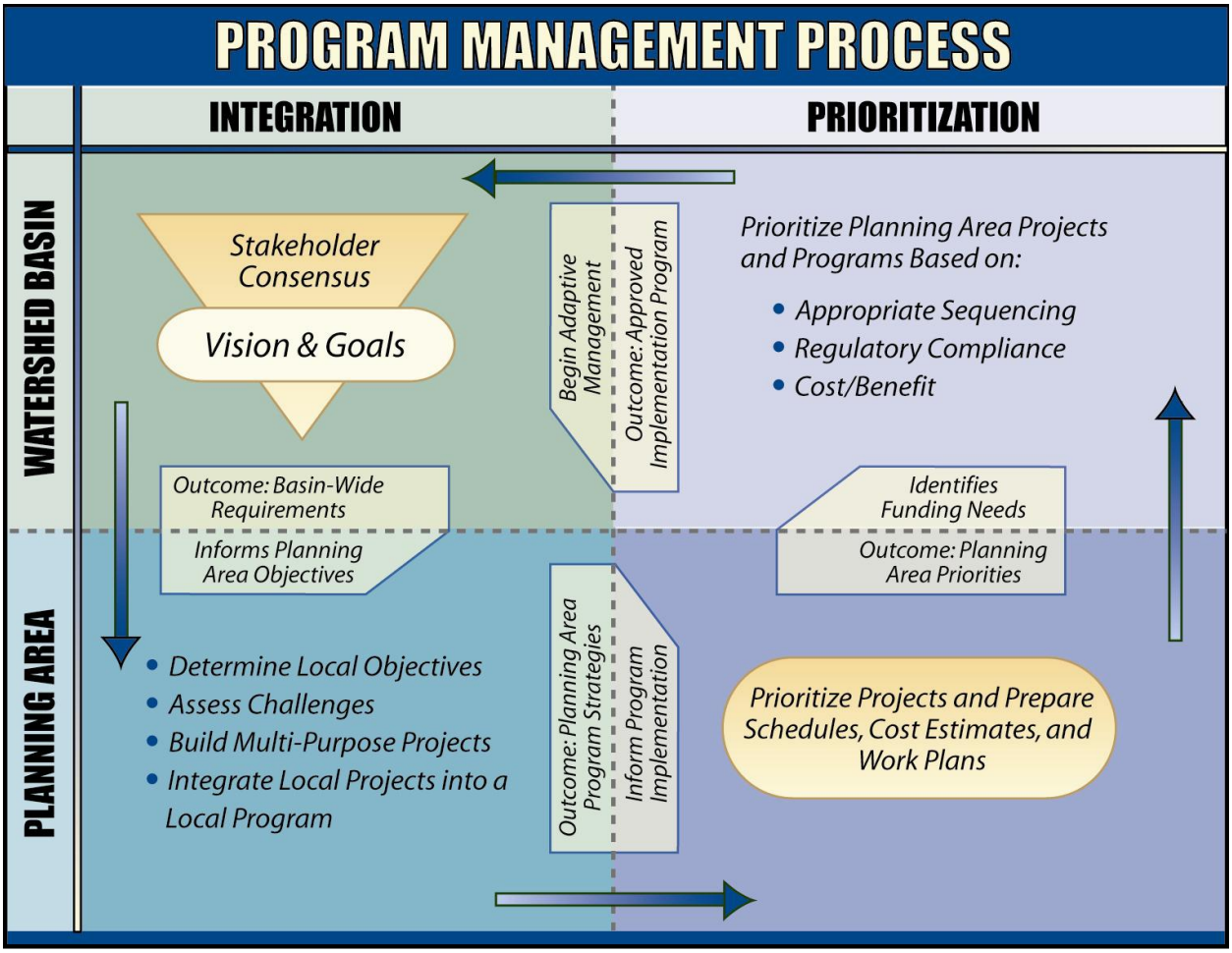

Figure 1-2: Overview of the Newport Watershed Management Plan Development and Implementation Strategy.

1.4 Adaptive Management Strategy

The overarching goal of the activities developed from the WMP process is to protect, and in some cases restore, the natural resources and beneficial uses of the watershed by addressing identified impacts. In order to effect this change, an adaptive management strategy is required as described below.

Assessment of Existing Conditions – Assess the current health and quality of the water, habitat, and environment through scientifically based studies. Many of these studies are underway or have been completed and are summarized in this WMP.

Study of Potential Impacts – Identify the sources and the level of impact of existing and potential impacts to the quality and health of the watershed through scientifically based studies. Several of these studies have been completed or are underway and are outlined in this WMP.

Specific Protection Measures – Design and implement specific measures to address the defined current impacts and prevent future impacts in order to protect the watershed resources using the outlined strategies and priorities of this WMP as a guide.

Specific Restoration Measures – Design and implement measures to restore habitats where applicable using the outlined strategies and priorities of this WMP as a guide.

Effectiveness Assessment – Continue assessment of the protection and restoration programs in terms of their effectiveness in meeting the long-term sustainability goal. Continue implementation, revise or end actions based on the results of the effectiveness assessment. An adaptive management approach using the results of the effectiveness assessment will continue implementation, revise or end management actions with the ultimate goal of creating a sustainable watershed.

1.5 Purpose of Plan

The purpose of the WMP is to provide the City and watershed stakeholders with a structured guide to protect and restore the Newport Coast Watershed and to set in motion those steps that will allow for the ecologic health of the watershed to be sustained. Watershed management is defined as the integration and coordination of activities that affect natural resources and water quality within a geographically defined drainage area. The Newport Coast Watershed contains sensitive ecological communities that, due to anthropogenic and natural stressors, require protection and, in some cases, restoration in order to be sustainable. This WMP defines strategies to accomplish long term sustainability of the watershed and must balance ecological needs with other community requirements, such as water use, recreation, planned land use, fire protection and canyon stability. In order to accomplish this longer-term vision, specific objectives are defined in this planning document which detail an overall watershed strategy. This strategy explicitly includes the prioritization of actions based on the level of impact, availability of resources and regulatory requirements.

In addition, this plan incorporates a regional perspective which integrates with the strategies of surrounding watersheds and statewide initiatives. This approach will enhance the effectiveness of the WMP and other regional management efforts. This WMP will need to be coordinated with plans being developed and implemented for the Harbor Area, Newport Bay, San Diego Creek, Laguna Canyon Creek, the Areas of Special Biological Significance, and other regional receiving waters and watersheds. As part of the steps to finalize this plan, coordination with these plans through the associated watershed managers and stakeholders is needed to meet program/project effectiveness targets.

SWRCB and nine Regional Water Quality Control Boards (RWQCBs), including Santa Ana Regional Board (SARWQCB), have implemented a statewide Watershed Management Initiative to provide water resource protection, enhancement, and restoration while balancing economic and environmental impacts. This initiative is to be accomplished using a watershed management approach.

The seed money for the development of this WMP was provided by a SWRCB Proposition 13 Grant (No. 04-191-558-0) to the City of Newport Beach. The City and community of Newport Beach appreciate this support from the State for the preparation of this plan toward the goal of watershed sustainability. It should be noted that the contents of this document do not necessarily reflect the views and policies of the SWRCB, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

1.6 Regulatory and City Planning Framework

Measures proposed under this plan to address the watershed objectives have been developed to be consistent with applicable and relevant federal, state and local regulations especially existing City planning documents and ordinances. The Newport Coast WMP attempts to provide a comprehensive approach toward integrating water quality, ecological, fire protection and community access goals and strategies. Table 1-1 presents the specific regulations and planning documents and the application of these in the development of this WMP.

Table 1-1: Summary of Regulations and City Planning Documents Applicable to WMP Strategies

Regulations or City Planning Documents	Applications to WMP
Water Quality	
Basin Plan for Santa Ana Region Waste Discharge Requirements under Order R8-2002-0010 NPDES No. CAS618030	Regulates Wet and Dry Weather Discharges to the Canyon Creeks. Water Quality Objectives in Basin Plan are applicable to Canyon Creeks. Water Quality Goals need to be consistent with these regulations. WMP Strategies need to be aligned with meeting these water quality objectives to the maximum extent practicable.
California Regional Water Quality Control Board Santa Ana Region *Waste discharge requirements for the Santa Ana region under Order No. R8-2002-0010 and NPDES No. CAS618030 (Waste Discharge Requirements for the County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County within the Santa Ana Region Area-wide Urban Storm Water Runoff)*	Regulates stormwater discharges under the NPDES permit. WMP Strategies need to be aligned with meeting these permit provisions to the maximum extent practicable.
State Water Resources Control Board Resolution No. 2000-108 *California Ocean Plan* *Water Quality Control Plan* Ocean Waters of California	Regulates discharges to ocean waters. WMP Strategies need to address potential impacts to the ASBS and ultimately achieve the anticipated natural water quality criteria to be defined in the exception process.

Regulations or City Planning Documents	Applications to WMP
State Water Resources Control Board State Water Resources Control Board Resolution No. 2006–0079 *2006 Federal Clean Water Act Section 303(d) List of Water Quality Limited Segments for California*	303(d) listings set total maximum daily loads of contaminants of concern into receiving waters. WMP Strategies need to be aligned with the 303(d) list to the maximum extent practicable.
Ecology	
General Plan: Harbor and Bay Element	Aims to preserve and enhance the existing and future benefits of the harbor and waterfront. The WMP needs to be aligned with this document.
General Plan: Recreation and Open Space Element	Aims to ensure that common public areas are accessible for recreational activities while ecological resources within these public areas are protected. The WMP needs to be aligned with this document.
Community	
General Plan: Harbor and Bay Element	Aims to preserve and enhance the existing and future benefits of the harbor and waterfront. The WMP needs to be aligned with this document
General Plan: Recreation and Open Space Element	Aims to maintain public accessibility to all public recreational and open space opportunities for people of Newport including citizens and visitors. The WMP needs to be aligned with this document
General Plan: City of Newport Beach Local Coastal Plan	General Plan: City of Newport Beach Local Coastal Plan provides review of natural resource and land use elements in the General Plan. The WMP needs to be aligned with this document.

2.0 WATERSHED EXISTING CONDITIONS

2.1 General Watershed Description

Newport Beach is a coastal community located approximately ten miles south of downtown Santa Ana and 50 miles southeast of Los Angeles, California. The Newport Coast Watershed covers approximately ten square miles and extends south of Corona Del Mar to El Morro Canyon (Figure 2-1).

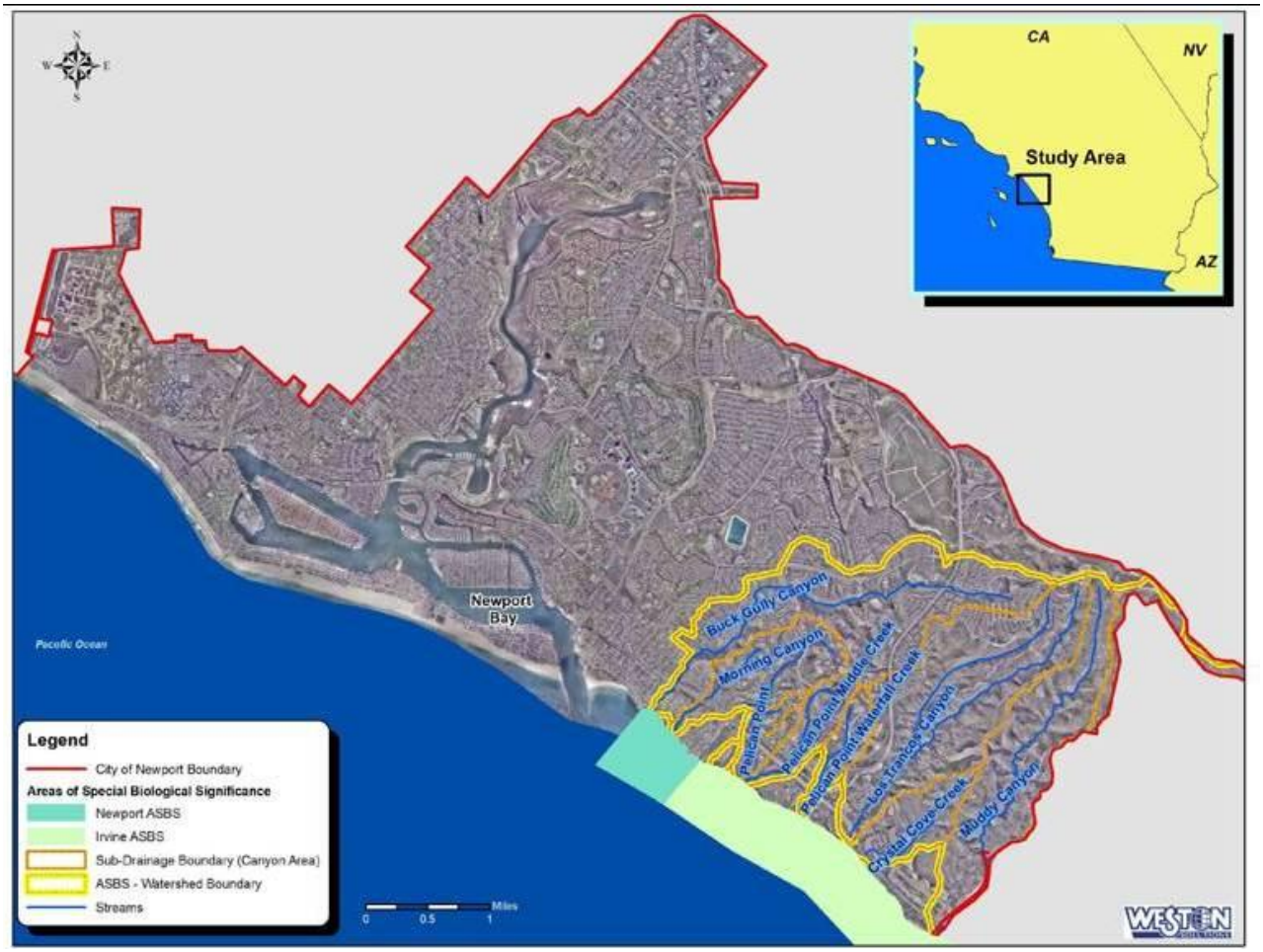

Figure 2-1: Newport Coast Watershed

As shown on Figure 2-1, the Newport Coast Watershed is one portion of the drainage area under the jurisdiction of the City. To the northwest, the adjacent drainage areas flow directly to Lower Newport Bay. In order to maximize project effectiveness, the measures outlined in this plan need to be coordinated with those of adjacent watersheds. Particular regard needs to be paid to regional integration of plans to ensure that proposed projects meet all designated goals and objectives. For example, runoff reduction programs within the Newport Coast Watershed need to be coordinated with those of adjacent watersheds under the City's jurisdiction to achieve greater effectiveness.

The Newport Coast Watershed discharges into two ASBS as shown on Figure 2-2. The two ASBS include the Newport Beach (Robert E. Badham) Marine Life Refuge (ASBS No. 32) and the Irvine Coast Marine Life Refuge (ASBS No. 33). The California Ocean Plan states that point and non-point source discharges of waste into these ASBS are prohibited. The City has submitted an "Exception" letter in response to requests by the SWRCB by the required date of May 31, 2006 for the discharges to these ASBS within the City's jurisdiction.

The watershed includes eight drainage areas, seven of which are within the City of Newport Beach boundaries (Figure 2-2). The canyon drainage areas include:

- Buck Gully: Reaches 1, 2 and 3
- Morning Canyon: Reaches 1 and 2
- Pelican Point
- Pelican Point Middle Creek
- Pelican Point Waterfall Creek
- Los Trancos Creek (and Crystal Cove Creek)
- Muddy Creek.

The eighth canyon creek drainage area, El Morro Creek, is located outside of the RWQCB Region 8 and the City of Newport Beach, but is included in the Newport Coast Watershed Plan. El Morro Creek is part of the Laguna Coast Wilderness Park and provides a reference canyon creek drainage area for natural background conditions for most of its length.

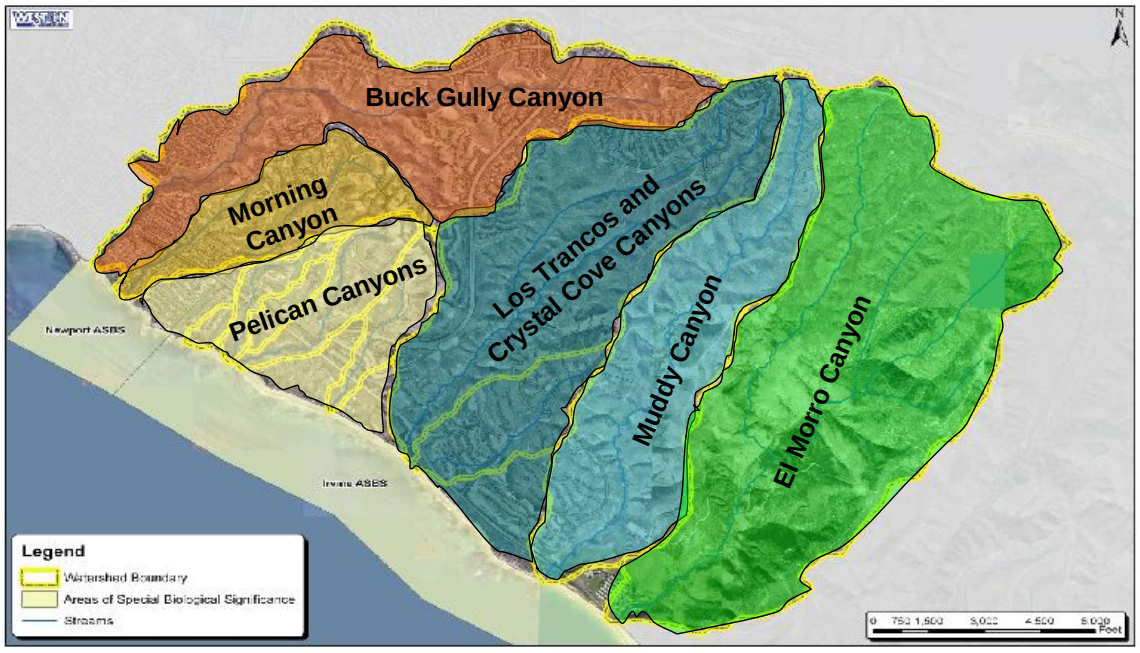

Figure 2-2: Newport Beach Coastal Subwatersheds

Most of the canyon creeks in the upper portions of the drainage areas are steep natural channels. Several are developed in both the upper and lower portions and contain concrete storm drain outlets. Unpaved access roadways and hiking trails exist in several canyons but are generally not maintained. The lower portions of the steep canyon creek channels have been subject to erosion

impacts caused primarily by a loss of sediment supply from the upper watershed areas. Other stressors to the system include increased peak flows due to larger areas of impervious surfaces, introduction of invasive/exotic plant species and an increasing water table due to over-irrigation that results in large exfiltration flows into the canyons.

2.2 Social and Community Resources

The social and community resources of Newport Coast Watershed are described in this section and include historical, social, cultural and economic trends.

2.2.1 History of the Watershed

Newport Beach was incorporated in 1906; however, most of the Newport Coast watershed was undeveloped coastal sage scrub habitat prior to 1940. Some cattle grazing did occur, which disturbed the native vegetation and caused a net increase in sediment loads in runoff and sedimentation of the canyon creek beds. Development of the Newport Coast watershed began to increase in the 1940's and 1950's. Grading operations for Shorecliff, Corona Highlands, Cameo Shores, and Corona Highland communities as well as transportation corridors like Highway 1 intruded into the canyon areas along Buck Gully and Morning Canyon. One offshoot of Morning Canyon, Surrey Canyon, was filled entirely. Since 1990, the watershed has been developed extensively, primarily for residential use (City of Newport Beach, 2006a).

2.2.2 Social and Cultural Description

According to the 2000 US Census, approximately 38,390 housing units exist and are inhabited by approximately 84,000 people in the City of Newport Beach, which is predominantly ethnically White followed by Hispanic, Asian, Black, Native American, and Native Hawaiian/Islanders (Census, 2000). The median age of residents is 41.

2.2.3 Economic Conditions and Trends

The financial plan for the City of Newport Beach for Financial Year (FY) 2006-2007 is a conservative and balanced plan that was developed in conjunction with broader, external influences. All Council reserve fund policies have been met and the proposed General Fund expenditures are fully offset by anticipated General Fund revenues. The City of Newport Beach presents its budget with the intention of delivering quality services to the citizens of, and visitors to, Newport Beach. With the current financial climate and past budget cuts handed down from the State of California (State), the City does not expect any significant increases in the general fund revenue from the State for use in funding implementation projects in this WMP.

Newport Beach is one of the premier coastal destinations in Southern California. According to the Newport Beach Conference and Visitors Bureau, tourism is one of the primary sources of income for the City, second only to the revenue generated by property taxes. The Travel Channel named Newport Beach one of the "Best Beaches for Families" in 2006. The City expects local recreation and tourism to contribute positive financial resources to the businesses and city in the form of revenue and taxes.

2.3 Physical Resources

The physical resources of the Newport Watershed are described in this section and summarized in the figure below (Figure 2-3). The resources of the ASBS are described in Section 3.

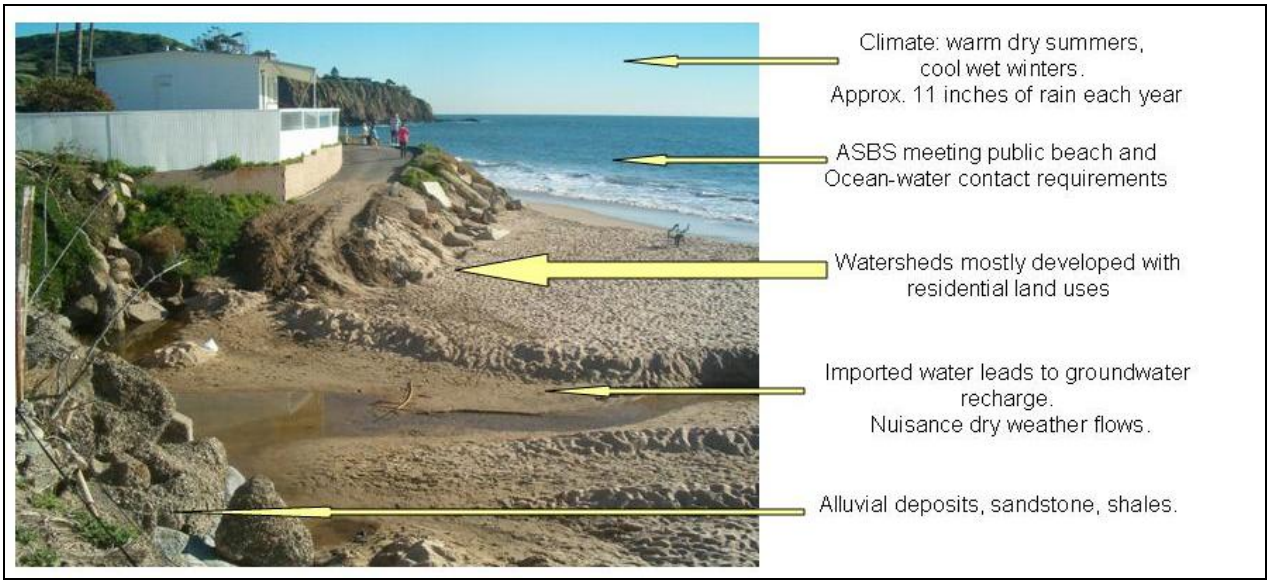

Figure 2-3: Newport's Physical Resources.

2.3.1 Climate

The semi-arid climate of the Newport Coast watershed is characterized by dry, warm summers and cool, wet winters. Temperatures generally fall in the mid- to high-70s range during the summer and the 60s during the winter. August and September are generally the warmest months and January and February the coolest. Nighttime temperatures rarely fall below 50 degrees during any time of the year. The majority of the area's rain falls in January and February, with average annual rainfall amounts of about 11 inches.

2.3.2 Geology

The geology of Newport Coast is characterized by numerous landslides and long, narrow alluvial deposits along the deeper coastal canyon creeks such as Morro Canyon and Buck Gully (Todd Engineers, 2006). In general the watershed is typified by consolidated sandstone, shales, and volcanic rocks which are overlain along the coastline by terrace deposits (Todd Engineering, 2006). The consolidated rocks are offset and uplifted along numerous faults, and geologic outcrops and faults generally run semi-parallel to the coast, southeast to northwest (Todd Engineering, 2006). Groundwater levels have increased with land development and associated increased use of imported water (Figure 2-4). These increased groundwater levels have translated into increased dry weather stream flows.

A major portion of the Newport Coast is underlain by the Monterey Formation, a marine shale which extends inland as much as 1.5 miles (Todd Engineering, 2006). Other inland portions are

characterized by outcrops of the Tertiary Vaqueros and Topanga marine sandstones and the San Onofre Breccias, which are ancient landslide deposits (Todd Engineering, 2006).

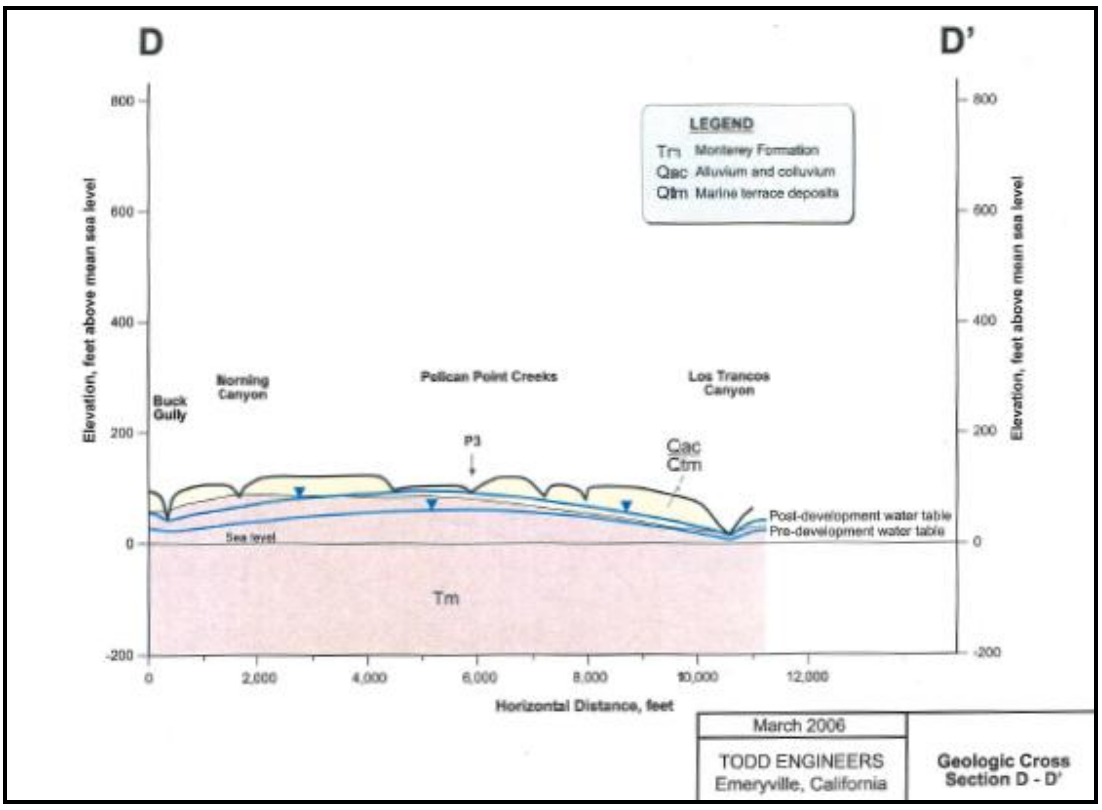

Figure 2-4: Geologic cross section of Newport Coast watershed between Buck Gully and Los Trancos (Crystal Cove Creek) show pre and post development groundwater levels.

2.3.3 Topography

The Newport Coast watershed's eight coastal canyons drain the San Joaquin Hills. The four largest canyons, Buck Gully, Los Trancos (Crystal Cove Creek), Muddy Canyon, and Morning Canyon, extend from the coastline to near Signal Peak, with an elevation of 1,164 feet above mean sea level (MSL) (Todd Engineers, 2006). The coastline is marked by gently sloping terraces that parallel the coastline. The major terrace extends from the coastal cliffs to an elevation of abut 200 feet above MSL; additional dissected terrace remnants occur at higher elevations up to about 400 feet (Todd Engineers, 2006).

2.3.4 Soils

The soil types within the Newport Coast watershed can be divided into three major soil associations: the Myford soil association situated on the terraces and the Alo-Bosanko association and Cieneba-Anaheim-Sopa association developed on sandstone and shale formations in the coastal hills (Todd Engineering, 2006). The Myford association is predominantly Myford soils, which are sandy loams greater than 60 inches thick on nearly level to moderately steep slopes. Myford sandy loam (173 on Figure 2-5) and Marina loamy sand

(162) soils occur extensively across the lower portions of the Newport Coast watersheds (Todd Engineers, 2006). The Alo-Bosanko soil association is characterized by clay soils, generally less than 40 inches thick, on relatively steep slopes (Todd Engineers, 2006). The Cieneba-Anaheim-Sopa association includes a variety of sandy loams, loams, clay loam, gravelly loams, and cobbly loams on sleep slopes (Todd Engineering, 2006). Alo clay soils (100, 101, 102) and Anaheim loams (107) are extensive within the Newport Coast watersheds, and Calleguas clay loam 134) is commonly found with the two hill associations (Todd Engineers, 2006).

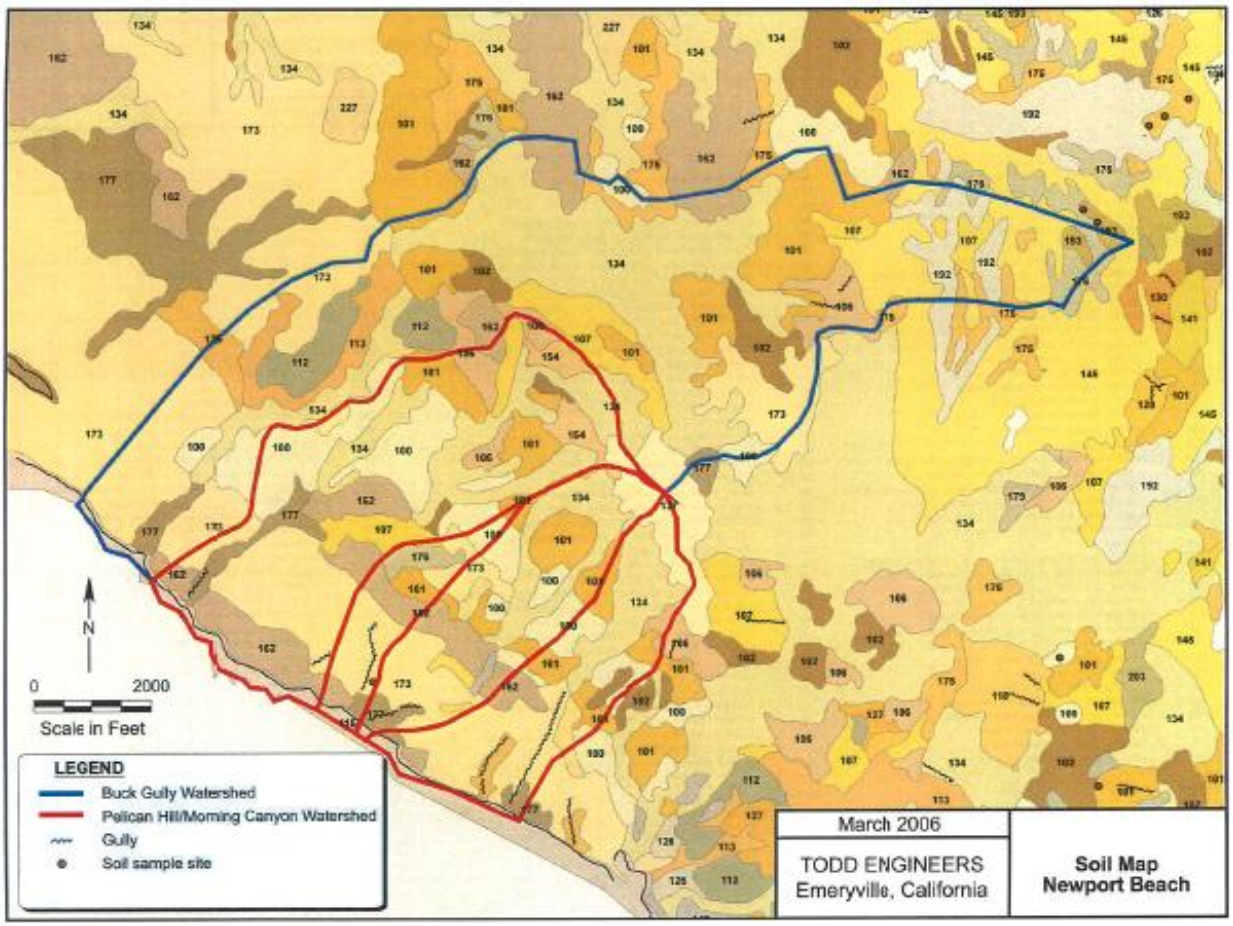

Figure 2-5: Soil map of the Newport Coast Watershed.

2.3.5 Land Use

Land use characteristics have a strong influence on the health of the watershed. In particular, the density and land use type have the potential to impact water quality. Land use is illustrated in Figure 2-6.

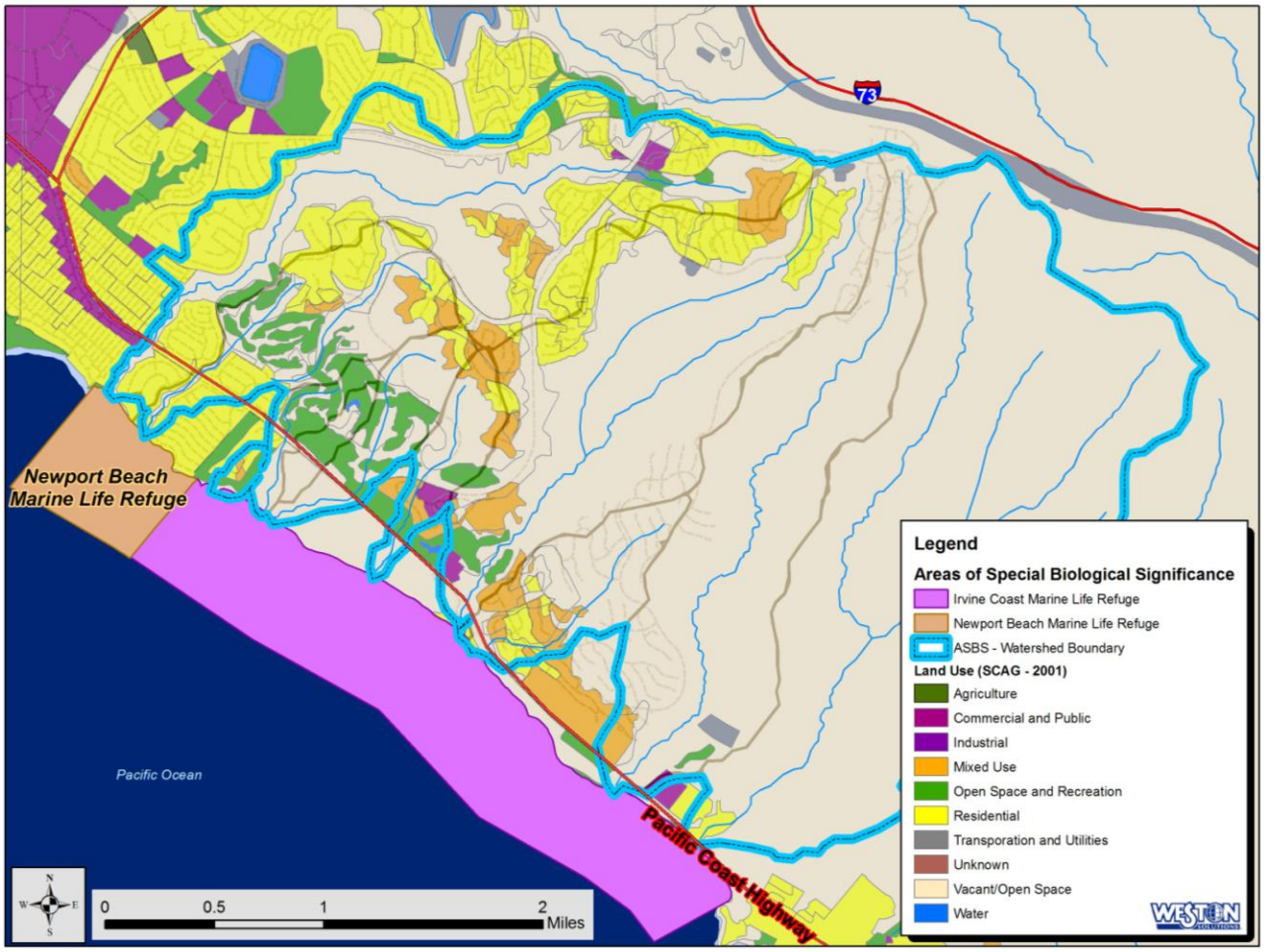

Figure 2-6: Newport ASBS Land Use Map

The drainage area of the Newport Coast watershed is 6,369 acres, or just 31 acres shy of ten square miles. The watershed comprises 20% of the total area of the City of Newport Beach. Table 2-1 presents the watershed area and the percentage of residential land use in each of the Newport Coast watershed's coastal canyons. Residential land use for each watershed was calculated using ArcView GIS and varies from 1% in El Morro Canyon to 59% in Buck Gully (Weston Solutions, 2006a). On average, residential land use comprises approximately 26% of the watershed if El Morro is included in the total, and 38% if not included (Weston Solutions, 2006a).

Table 2-1: Watershed and Sub-watershed Areas - Percent Residential Land Use.

Coastal Canyon	Watershed Area (acres)	Residential Area (acres)	Residential Use
Buck Gully	1261	743	59%
Morning Canyon	387	210	54%
Pelican Point	23	9	40%
Pelican Point Middle Creek	235	22	9%
Pelican Point Waterfall Creek	143	34	24%
Los Trancos (Crystal Cove Creek)	1181	401	34%
Muddy Canyon	996	211	21%
SUBTOTAL (NOT INCLUDING EL MORRO):	**4226**	**1630**	**38%**
El Morro Canyon	2143	29	1%
TOTAL:	**6,369**	**1,659**	**26%**

Table 2-2 presents the land use in the Newport Beach Marine Life Refuge ASBS drainage area (SCAG, 2001). The drainage area of the ASBS consists of 1659.32 acres and the majority of the drainage area is either residential, 733.27 acres, or vacant land, 729.06 acres (Weston Solutions, 2006b). The rest of the watershed is open land and recreation (100.22 acres), mixed use or under construction (82.74 acres), commercial and public (10.44 acres), and transportation and utilities (3.61) (Weston Solutions, 2006b). There are no industrial areas within the watershed. The vacant land is located on either side of Buck Gully and Morning Canyon Creek and is bordered by residences and open parks.

Table 2-2: Land Use Percentage for the Newport Beach Marine Life Refuge ASBS Drainage Area.

Land Use Type	Total Acres	Percentage
Commercial and Public	10.44	0.6%
Mixed Use/Under Construction	82.74	5.0%
Open Space and Recreation	100.22	6.0%
Residential	733.27	44.2%
Transportation and Utilities	3.61	0.2%
Vacant	729.06	43.9%
Grand Total	1,659.34	100%

The majority of the watershed land use is golf course and residential. The watershed land uses also include surface streets and, due to a few vacant lots, some areas of mixed use. Table 2-3 presents the land use types, total acres and percentage of the total land use types in the ASBS watershed.

Table 2-3: Land Use in the Pelican Point Community Drainage Area.

Land Use Type	Total Acres	Percentage of Total Land Use Types
Mixed Use/Under Construction	2.69	4.9%
Open Space and Recreation*	23.21	42.7%
Residential	21.07	38.7%
Transportation	5.17	9.5%
Vacant	2.27	4.2%
Grand Total	54.41	100.0%

*Note: Recreation means Golf Courses

Table 2-4 presents the land use, acreage and average percentage of impervious surface within the Newport Beach Marine Life Refuge (SCAG, 2001). The drainage area for the ASBS has an average impervious surface percentage of 44.5% (Weston Solutions, 2006b). Along the coast, where the majority of the population resides, the impervious surface area is close to 85%. Table 2-4 presents the impervious surface area of ASBS drainage.

Table 2-4: Average Percent of Impervious Surfaces in the Newport Beach Marine Life Refuge Drainage Area.

Land Use Type	Total Acres	Percentage of Impervious Surface (Average)
Commercial and Public	10.44	85.0%
Mixed Use	82.74	50.0%
Open Space and Recreation	100.22	5.0%
Residential	733.27	43.8%
Transportation and Utilities	3.61	80.0%
Vacant	729.06	3.0%

Table 2-5 presents the land use type, acreage, and average percentage of impervious surface within the drainage area of the Pelican Point community discharge (SCAG, 2001). Table 2-5 presents the impervious surface area of the drainage. The golf course represents the majority of the land use types, followed by residential land use. Golf courses have a low percentage of impervious surfaces; approximately 5%. The Pelican Point residential area has an average of 40% impervious surface, meaning less precipitation and urban runoff will be able to get into the soil due to pavement and structures (Weston Solutions, 2006b).

Table 2-5: Average Percent of Impervious Surfaces in the Pelican Point Community Drainage Area.

Land Use Type	Total Acres	Percentage of Impervious Surface (Average)
Mixed Use/Under Construction	2.69	50%
Open Space and Recreation*	23.21	5%
Residential	21.07	40%
Transportation	5.17	90%
Vacant	2.27	3%

*Note: Recreation includes Golf Courses

2.4 Hydrologic Resources

The hydrologic resources of the Newport Watershed presented in this section encompass both current and anticipated water sources with a focus on the sources of potable water necessary to sustain both current and future needs.

2.4.1 Current Resources

Water resource issues in the Newport Coast watershed are similar to many other areas in Southern California. In general, the high volume of imported water required to service the needs of the community exceeds the average rainfall. Dry and wet weather urban runoff significantly impairs surface water quality.

According to the City of Newport Beach's General Plan, water service within Newport Beach is provided by the City of Newport Beach, Irvine Ranch Water District (IRWD), and Mesa Consolidated Water District (Mesa). Generally, Newport Beach provides water services to approximately 13.5 square miles of the City; IRWD serves approximately nine square miles; and Mesa serves less than one square mile. Domestic water for the City is supplied by both groundwater and imported surface water. Currently, about 64 percent of the water supplied to both the City and Mesa's service area is from groundwater from the Orange County Groundwater Basin (administered by the Orange County Water District or OCWD), and the remaining 36 percent of water supply is provided by the Metropolitan Water District (MWD), which delivers surface water imported from the Colorado River and State Water Project (City of Newport Beach, 2006b). This ratio can change year to year based on the OCWD's administration of the Basin's supply. Approximately 35 percent of IRWD's current water supply is purchased from MWD, with the remaining 65 percent coming from groundwater (City of Newport Beach, 2006b).

The City also began purchasing recycled water from OCWD and IRWD in 1999, and has identified and approached all cost-effective end users in the City that could potentially use recycled water, and uses a combination of incentives to encourage recycling. The City has maximized opportunities for end users of recycled water and could only increase users if a neighboring water agency provided the reclaimed water to the City. Currently, reclaimed water makes up 20 percent of IRWD's total water supply (City of Newport Beach, 2006b).

Total water importation within the Newport Coast watershed averages 2,697 acre-feet per year (AFY), which exceeds the average rainfall within the watersheds of 2,352 AFY (Todd Engineering, 2006). Water importation, combined with increased urbanization, has resulted in an increase in groundwater recharge from an estimated 66 AFY, prior to extensive development within the watershed, to an estimated 269 AFY currently (Todd Engineering, 2006).

The City currently has a comprehensive urban watershed management program that includes pollution prevention, source control and treatment control measures to address pollutants that may be carried by storm water runoff. The City has traditionally been concerned with urban runoff issues and has embarked on a number of programs to improve water quality on its own in addition to its compliance with State and regional regulatory efforts that include, Total Maximum Daily Loads (TMDLs), National Pollution Discharge Elimination System (NPDES), and Sanitary Sewer Overflows.

Total Maximum Daily Loads (TMDLs)

Two canyon creeks within the watershed, Buck Gully and Los Trancos (including Crystal Cove Creek), are designated as "water quality-limited" for impairments under the federal Clean Water Act's Section 303(d) and are listed on the 2006 CWA Section 303(d) List of Water Quality Limited Segments (City of Newport Beach, 2006b). Being "water quality-limited" means that a water body is "not reasonably expected to attain or maintain water quality standards" without additional regulation. Buck Gully and Los Trancos are listed for total and fecal coliforms downstream of Pacific Coast Highway. The law requires that United States Environmental Protection Agency (US EPA) develop TMDLs for each impaired water body in the nation. The TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards (City of Newport Beach, 2006b). A TMDL may also include a plan for bringing an impaired water body back within standards. In addition, Buck Gully Creek, Pelican Point Creek, Los Trancos, and Muddy Creek do not support one or more of the following beneficial uses: water contact recreation (REC-1), non-contact recreation (REC-2) and municipal and domestic supply (MUN) (Weston Solutions, 2006a).

National Pollution Discharge Elimination System (NPDES)

Newport Beach operates a municipal separate storm sewer system (MS4) permit under the NPDES program. MS4 permits require an aggressive water quality ordinance, specific municipal practices, and the use of best management practices (BMPs) in many development-related activities to further reduce the amount of contaminants in urban runoff. An example of such an infringement is presented in Figure 2-7. MS4 permits also require local agencies to cooperatively develop a public education campaign to inform people about what they can do to protect water quality.

Figure 2-7: Example of Dry Weather Flows

The Drainage Area Management Plan (DAMP) developed by the City in response to the MS4 permit serves as the foundational plan to facilitate coordination and implement programs to reduce the discharge of pollutants from municipal stormwater conveyance systems (City of Newport Beach, 2006b). Under the DAMP, the City monitors runoff, inspects construction, industrial, commercial, and residential areas, enforces discharge prohibitions, regulates development, and conducts public participation and education programs. The monitoring and effectiveness studies conducted as part of the DAMP show reductions in pollutants and increased public awareness. Reductions in pollutant loadings from the DAMP program reduce potential impacts to the ASBS from direct discharges of urban runoff to the reserves.

Sanitary Sewer Overflows

Newport Beach owns and operates a wastewater collection system that collects residential and commercial wastewater and transports it for treatment to the Orange County Sanitation District (OCSD). Portions of the City receive wastewater service from IRWD. Residences and businesses hook up private lateral lines to the City's collection lines. Private and public lines and the City's pump stations have the potential to cause sanitary sewer overflows (SSOs), which may lead to beach closures in and around Newport Beach each year (City of Newport Beach, 2006b). Most

SSOs in the area are caused by line blockages from grease and root clogs, or maintenance failures of plumbing associated with pump stations at China Cove Beach and Corona del Mar (City of Newport Beach, 2006b). The City regulates the disposal of grease and other insoluble waste, and follows a defined Sewer System Master Plan to replace or reline older wastewater lines and upgrade pump stations to reduce the incidence of SSOs.

2.4.2 Future Resources (20-Year Planning Horizon)

The City of Newport Beach General Plan states that the future water supply projection assumes that the City will continue to produce groundwater and purchase local water from MWD, which is projected to meet 100 percent of the City's imported water needs until the year 2030. Beyond that, improvements associated with the State Water Project supply, additional local projects, conservation, and additional water transfers would be needed to adequately provide surface water to the City. The Groundwater Replenishment System (GRS), a joint venture by OCWD and the OCSD, will help reduce Orange County and Newport Beach's reliance on imported surface water by taking treated wastewater and injecting it into the groundwater basin (City of Newport Beach, 2006b). GRS will be online by 2007, and will produce approximately 70,000 acre feet of water per year (City of Newport Beach, 2006b). OCWD projects that there would be sufficient groundwater supplies to meet any future demand requirements in Newport Beach. IRWD's treated and clear groundwater supplies are also expected to be a significant source of potable water in the future. MWD water will be required for supplemental supply as well as peak and emergency conditions.

2.5 Biological Resources and Habitat

General biological surveys were performed by the Chambers Group in November 2005 on Buck Gully, Morning Canyon, Pelican Point Creek, Pelican Point Middle Creek, Pelican Point Waterfall Creek, Los Trancos (Crystal Cove Creek), Muddy Creek, and Morro Canyon. Surveys were conducted in order to identify vegetation communities, determine CDFG and USACE jurisdiction, and to report potential presence of sensitive species.

Dudek & Associates, Inc. (Dudek) conducted biological surveys on 18.4 acres within Buck Gully between April and July of 2005. These surveys were conducted in support of the City of Newport's proposal to construct a detention basin in the middle reach of the canyon. The total area surveyed represents about 6.6 % of the total area of Buck Gully.

2.5.1 Vegetation

Chambers Group performed vegetation surveys of the eight canyon creeks in the fall of 2005. The surveys found both native and non-native vegetation communities. Native communities, in order of dominance, included coastal sage scrub, chaparral, riparian scrub, Mexican elderberry scrub, coastal bluff scrub, coastal saltbush scrub, and freshwater marsh (Chambers Group, 2006). Results are summarized in Table 2-6.

Table 2-6: Vegetation Community Composition in Newport Coast Watershed Canyons (Chambers Group, 2006).

Canyon Creek	Native Vegetation Communities Present	Non-Native Vegetation Communities Present
Buck Gully Total acres: 275	40% Coastal Sage Scrub 23% Chaparral 11% Riparian Scrub 7% Mexican Elderberry Scrub 7% Revegetated CSS <1% Coastal Saltbush Scrub, Freshwater Marsh	4% Annual grassland 3% Ornamental landscaping 3% Iceplant <1% Developed, disturbed, giant reed, Myoporum, Pampas grass
Morning Canyon Total acres: 33	40% Coastal Sage Scrub 14% Riparian Scrub 1% Chaparral <1% Freshwater Marsh	42% Ornamental landscaping <1% Annual grassland, Artichoke thistle, Disturbed, Giant reed, Golf course, Myoporum, Pampas grass, Pepper tree
Pelican Point Creek & Pelican Point Middle Creek Total acres: 39	80% Coastal Sage Scrub 15% Coastal Bluff Scrub <1% Coastal saltbush Scrub, Freshwater Marsh, Mexican Elderberry Scrub, Riparian Scrub	3.5% Developed <1% Myoporum, Pepper tree
Pelican Point Waterfall Creek Total acres: 5	85% Coastal Sage Scrub 14% Coastal Saltbush Scrub	<1% Iceplant
Los Trancos Creek (Crystal Cove Creek) Total acres: 470	57% Coastal Sage Scrub 20% Chaparral 11% Riparian Scrub 2% Revegetated CSS <1% Coastal Saltbush Scrub, Freshwater Marsh	6% Developed 2% Golf Course <1% Disturbed, Eucalyptus, Ornamental Landscaping, Artichoke thistle, Giant reed
Muddy Creek Total acres: 350	29% Coastal Sage Scrub 24% Chaparral 9% Revegetated CSS 6% Riparian Scrub <1% Coastal Saltbush Scrub, Freshwater Marsh	28% Black Mustard 3% Developed <1% Ornamental landscaping, Disturbed
Morro Canyon Total acres: 402	60% Coastal Sage Scrub 11% Riparian Scrub 9% Chaparral	18% Annual grassland 1% Artichoke thistle <1% Disturbed, Ornamental landscaping, Black mustard, Myoporum

Figure 2-8: Coastal Sage Scrub

Coastal sage scrub (CSS) (Figure 2-8) communities occupied about half (49%) of the undisturbed land within the Newport Coast Watershed canyons; 775 acres of the 1574 acres surveyed were CSS. The CSS community within the canyons was dominated by California buckwheat and California sagebrush *(Artemisia californica)*. Black sage *(Salvia mellifera)* was also found in low densities, and other shrubs such as laurel sumac *(Malosma laurina)*, lemonadeberry *(Rhus integrifolia)*, coyote brush *(Baccharis pilularis)*, and Mexican elderberry *(Sambucus mexicana)* were common. Over 50 acres of successful coastal sage scrub restoration, comprised of low fire-danger species) were also found to also exist within the watershed's canyons.

Chaparral was the second-most abundant vegetation community within the watershed canyons. The chaparral community occupied 275 acres (17% of the surveyed area) within the canyons and

consisted of California sagebrush, laurel sumac, lemonadeberry, and toyon *(Heteromeles arbutifolia)*. Poison oak *(Toxicodentron diversilobum)* was also present in large patches.

Riparian scrub communities occupied nearly 148 acres (9% of the surveyed area) within the canyons, the third highest of any plant community. The riparian scrub community within the canyons was comprised of arroyo willow *(Salix lasiolepis)*, mule fat *(Baccharis salicifolia)*, and western sycamore. Other riparian species present include celery (*Apium graveolens*), brass buttons (*Cotula coronopifolia*), California cottonweed (*Epilobium ciliatum*), salt marsh fleabane (*Pluchea odorata*), water pepper (*Polygonum hydropiperoides*), annual beard grass (*Polypogon monspeliensis*), watercress (*Rorippa nasturtium-aquaticum*), California blackberry (*Rubus ursinus*) and giant creek nettle (*Urtica dioica* ssp. *Holosericea*).

In addition to developed and disturbed areas, which comprised 42 and 8 acres, 3% and <1% respectively; dominant non-native vegetation communities included black mustard (97 acres), annual grassland (85 acres), and ornamental landscaping (28 acres). Other non-native vegetation (in order of descending acreage) included iceplant (Figure 2-9), artichoke thistle, myoporum, eucalyptus, pampas grass, giant reed, and pepper tree.

Figure 2-9: Ice Plant

No special-status plant species were observed during the 2005 Chambers Group vegetation surveys, although 35 species are believed to either occur or have the potential to occur within the study area (Chambers Group, 2006). To confirm presence or absence of special-status species, the Chambers Group report recommended focused surveys during the appropriate flowering periods. The vegetation surveys performed during 2005 did not achieve 100% coverage of the watershed's canyons, nor were they performed at a time of year when all species would have been identifiable (Chambers Group, 2006).

Within the portion of Buck Gully surveyed by Dudek, 12 plant communities and other land covers were identified (Dudek, 2005). Of the 89 species of vascular plants identified, 53% were native species and 43% were non-native. Table 2-7 describes the vegetation communities found within the study area.

Table 2-7: Vegetation Community Composition in the Middle Reach of Buck Gully Canyon (Dudek, 2005).

Vegetation Community	Acreage	Percent of Total
Alkali Meadow	0.05	<1%
Coastal Freshwater Marsh	0.17	<1%
Mexican Elderberry Woodland	4.39	23.8%
Disturbed Mexican Elderberry Woodland	0.20	1%
Perennial Rivers and Streams	0.53	2.9%
Parks and Ornamental Plantings	2.49	13.5%
Ruderal	1.41	7.7%
Sagebrush – Coyote Bush Sage Scrub	6.30	34.2%
Disturbed Sagebrush – Coyote Bush Sage Scrub	0.49	2.7%
Sagebrush – Grassland	1.08	5.9%
Southern Willow Scrub	1.14	6.2%
Urban	0.14	<1%
Total	18.40	

Dudek found sagebrush and coyote bush scrub to be the most abundant type of vegetation community found within the middle reach of Buck Gully. This type of coastal sage scrub is dominated by California sagebrush and coyote bush with California encelia (*Encelia californica*), lemonadeberry, and Mexican elderberry also typical. About 43% of the study area was described as sagebrush, disturbed sagebrush, or sagebrush grassland (a mix of about 30% California sagebrush mixed with non-native grasses). Dudek found the next most abundant vegetation community to be Mexican elderberry woodland and disturbed Mexican elderberry woodland, which covered a combined total of about 25% of the study area. Parks, ornamental plantings, and ruderal (disturbed) habitats comprised about 21% of the study area. Southern willow scrub covered about 6% of the study area.

No special-status plant species were observed within the middle reach of Buck Gully during the 2005 Dudek vegetation survey, although four sensitive species were believed to have a moderate or high potential to occur within the study site (Dudek, 2005). The Dudek surveys occurred during the appropriate flowering period and within a favorable rainfall year for three of these species: crownbeard (*Verbesina dissita*), Catalina mariposa lily (*Calochortus catalinae*), and Coulter's matilija poppy (*Romneya coulteri*). Due to the favorable conditions under which the surveys were performed, these species were considered absent from the site (Dudek, 2005). The fourth species, Nuttall's scrub oak (*Quercus dumosa*), is a large woody plant which would have been unlikely to be missed (Dudek, 2005). Nuttall's scrub oak is also believed to be absent from the site.

2.5.2 Wildlife

Chambers Group fall 2005 surveys of the Newport Coast Watershed's canyon creeks found 41 different species of wildlife, including eight native species of butterflies, three native species of amphibians, five native species of reptiles, 20 native species of birds, and four native species of mammals (Chambers Group, 2006). One non-native amphibian, bullfrog *(Rana catesbeiana)*, was also found. The third largest canyon by acreage, Muddy Creek, contained 27 native species. Buck Gully, the fourth largest canyon surveyed, was found to contain 26 native species. The largest canyon, Los Trancos (Crystal Cove Creek), contained 22 native species. Morning Canyon, the three Pelican Point canyons, and Morro Canyon each had between 18 and 15 species. Results of the Chambers Group wildlife surveys are summarized in Table 2-8.

Table 2-8: Wildlife Species in Newport Coast Watershed Canyons (Chambers Group, 2006).

● **Species Observed** ○ **Species Likely to Occur** - **Species Neither Observed nor Likely**	**Buck Gully**	**Morning Canyon**	**Pelican Point Creek**	**Pelican Point Middle Creek**	**Pelican Point Waterfall Creek**	**Los Trancos (Crystal Cove)**	**Muddy Creek**	**Morro Canyon**
Butterflies								
Buckeye *(Junonia coenia)*	●	-	-	-	-	-	-	-
Common white *(Pontia protodice)*	○	●	●	●	●	○	○	○
Cabbage white *(Pieris rapae)*	●	○	●	●	●	●	●	●
Mourning cloak *(Nymphalis antiopa)*	●	●	●	●	●	●	●	●
Striated queen *(Danaus gilippus)*	●	●	○	○	○	○	○	○
California sister *(Adelpha bredowii californica)*	●	○	○	○	○	○	●	○
Painted lady *(Vanessa cardui)*	○	○	○	○	○	○	●	○
Sulphur *(Colias* sp.*)*	-	-	●	●	●	-	-	-
Amphibians								
Pacific chorus frog *(Pseudacris regilla)*	●	●	○	○	○	●	●	●
California treefrog *(Hyla cadaverina)*	○	○	○	○	○	○	○	○
Western toad *(Bufo boreas boreas)*	○	○	○	○	○	○	○	○
Bullfrog *(Rana catesbeiana)**	●	-	-	-	-	-	-	-
Reptiles								
California common kingsnake *(Lampropeltis getula californiae)*	○	○	○	○	○	●	○	○
Gopher snake *(Pituophis melanoleucus)*	-	-	-	-	-	●	-	-
Garter snake *(Thamnophis elegans)*	-	-	-	-	-	-	●	-
Side-blotched lizard *(Uta stansburiana)*	○	○	○	○	○	○	○	○
Western fence lizard *(Sceloporus occidentalis)*	●	○	○	○	○	○	●	●
Birds								
Red tailed hawk *(Buteo jamaicensis)*	●	-	-	-	-	●	●	-
Turkey vulture *(Cathartes aura)*	●	-	●	●	●	●	●	●
Bushtit *(Psaltriparus minimus)*	●	●	●	●	●	●	●	●
Red-winged blackbird *(Agelaius phoeniceus)*	●	●	-	-	-	-	-	-
Bewick's wren *(Thryomanes bewickii)*	●	●	●	●	●	●	●	●
House finch *(Carpodacus mexicanus)*	●	●	●	●	●	●	●	-
California towhee *(Pipilo crissalis)*	●	●	●	●	●	●	●	●
White-crowned sparrow *(Zonotrichia leucophyrs)*	●	●	●	●	●	●	●	-
Rock dove *(Columba livia)*	●	●	-	-	-	-	●	-
Mourning dove *(Zenaida macroura)*	●	●	●	●	●	●	●	-
Black phoebe *(Sayornis nigricans)*	●	●	●	●	●	●	●	●
American crow *(Corvus brachyrhynchos)*	●	●	●	●	●	●	●	●
Common raven *(Corvus corax)*	●	●	●	●	●	●	●	-
California quail *(Callipepla californica)*	-	-	-	-	-	-	●	-
Western scrub jay *(Aphelocoma californica)*	-	-	-	-	-	-	●	-
Northern flicker *(Colaptes auratus)*	-	-	-	-	-	●	-	-
Yellow-rumped warbler *(Dendroica coronata)*	●	●	●	●	●	●	●	●
California gnatcatcher (*Polioptila californica californica*)^	●	-	●	●	●	●	●	●
Cooper's hawk *(Accipiter cooperi)*^	●	-	-	-	-	-	-	-
Western snowy plover *(Charadrius alexandrinus nivosus)*^	-	-	-	-	-	-	●	-
Mammals								
Coyote *(Canis latrans)*	●	○	○	○	○	●	●	●
Mule deer *(Odocoileus hemionus)*	○	○	○	○	○	●	●	●
Raccoon *(Procyon lotor)*	●	○	●	●	●	○	○	○
Desert cottontail *(Sylvilagus audubonii)*	●	●	●	●	●	●	●	●
Common rodent species	○	○	○	○	○	○	○	○

*Non-native ^Sensitive species

Figure 2-10: Morning Cloak Butterfly

Chambers Group found that mourning cloak *(Nymphalis antiopa)* and cabbage white *(Pieris rapae)* were the most common species of butterflies found in the Newport Coast watershed canyons. Mourning cloak (Figure 2-10) were found in each of the eight canyons while cabbage white were found in seven canyons. Other butterflies with a high likelihood for occurrence included common white *(Pontia protodice)*, striated queen *(Danaus gilippus)*, California sister *(Adelpha bredowii californica)*, and painted lady *(Vanessa cardui)*. Of the above species, only the common white was found in at least half of the canyons. Buckeye *(Junonia coenia)* and sulphur *(Colias sp.)* were each found in a few canyons but were not determined to have a high likelihood of occurrence in the other canyons (Chambers Group, 2006).

Pacific chorus frog *(Pseudacris regilla)* was found in five canyons and was the only native amphibian found. California treefrog *(Hyla cadaverina)* and western toad *(Bufo boreas boreas)* were determined to have a high likelihood of occurrence in all canyons (Chambers Group, 2006). Bullfrog was found in one canyon.

Figure 2-11: Western Fence Lizard

Western fence lizard *(Sceloporus occidentalis)* (Figure 2-11) was the most common native reptile found by Chambers Group, with sightings in three canyons. California common kingsnake *(Lampropeltis getula californiae)*, gopher snake *(Pituophis melanoleucus)*, and garter snake *(Thamnophis elegans)* were each found in one canyon each. California common kingsnake and side-blotched lizard *(Uta stansburiana)* were determined to be likely to occur in each of the canyons (Chambers Group, 2006).

Chambers Group determined that several native species of birds were found in all canyons: bushtit *(Psaltriparus minimus)*, Bewick's wren *(Thryomanes bewickii)*, California towhee *(Pipilo crissalis)*, black phoebe *(Sayornis nigricans)*, American crow *(Corvus brachyrhynchos*), and yellow-rumped warbler *(Dendroica coronata)*. Turkey vulture *(Cathartes aura)*, house finch *(Carpodacus mexicanus)*, white-crowned sparrow *(Zonotrichia leucophyrs)*, mourning dove *(Zenaida macroura)*, common raven *(Corvus corax)*, and California gnatcatcher *(Polioptila californica californica)*, a special-status species, were each found in seven canyons. Red tailed hawk *(Buteo jamaicensis)* and rock dove *(Columbia livia)* were each found in three canyons. California quail *(Callipepla californica)*, western scrub jay *(Aphelocoma californica)*, and northern flicker *(Colaptes auratus)* were found in only one canyon each, as were special-status species Cooper's hawk *(Accipiter cooperi)* and western snowy plover *(Charadrius alexandrinus nivosus)* (Figure 2-12) (Chambers Group, 2006).

Figure 2-12: Western Snowy Plover

Cooper's hawk (Figure 2-13) is a California Special Concern (CSC) species, while California gnatcatcher and coastal populations of nesting western snowy plover are California Special Concern species and also federally threatened. A Cooper's hawk was observed soaring over Buck Gully and another individual, or possibly the same bird, was observed perching in a eucalyptus tree (Chambers Group, 2006). No Cooper's hawk nests were observed. Coastal California gnatcatcher was found in all canyons except Morning Canyon. Five western snowy plover were observed at the mouth of Muddy Creek. Focused surveys determined that the federally endangered least Bell's vireo (*Vireo bellii pusillus*) was not present in any of the canyons (Chambers Group, 2006; Dudek, 2005).

Figure 2-13: Cooper Hawk

Desert cottontail was the most commonly observed native mammal, it was observed in each of the canyons by Chambers Group. Coyote *(Canis latrans)* and raccoon *(Procyon lotor)* were each found in four canyons. Mule deer *(Odocoileus hemionus)* was observed in three canyons, Los Trancos (Crystal Cove Creek), Muddy Creek, and Morro Canyon. Common rodent species were deemed likely to occur in all canyons but not observed (Chambers Group, 2006).

Dudek observed 28 native wildlife species within the middle reach of Buck Gully between April and July 2005. General wildlife inventories were conducted in addition to focused surveys for least Bell's vireo and coastal California gnatcatcher. Observations included 12 invertebrate species, one amphibian species, one reptile species, nine bird species, and five species of mammals. Wildlife observations from the Dudek survey are listed and compared to Chambers Group findings from November 2005 in Table 2-9. Variations may be attributed to seasonal fluctuations.

Table 2-9: Wildlife Species in Middle Reach of Buck Gully Canyon (Dudek, 2005).

• Species Observed by Dudek ✓ Species Observed by Dudek and Chambers Group ○ Species Likely to Occur (per Dudek) - Species Neither Observed nor Likely	Buck Gully Middle Reach
Butterflies	
Funereal duskywing (*Erynnis funeralis*)	●
Tiger swallowtail (*Papilio rutulus)*	●
Cabbage white *(Pieris rapae)*	✓
Common white *(Pontia protodice)*	✓
California dogface (*Colias eurydice*)	●
Behr's metalmark (*Apodemia mormo virgulti*)	●
Southern (silvery) blue (*Glaucopsyche lygdamus*)	●
Acmon blue (*Plebejus acmon*)	●
Painted lady *(Vanessa cardui)*	✓
Buckeye *(Junonia coenia)*	✓
Lorquin's admiral (*Limenitis lorquini*)	●
Mourning cloak *(Nymphalis antiopa)*	✓
Amphibians	
Pacific treefrog *(Hyla regilla)*	●
Western spadefoot toad (*Spea hammondii*)	○
Reptiles	
Western fence lizard *(Sceloporus occidentalis)*	✓
Orange-throated whiptail (*Aspidoscelis hyperythra*)	○
Coastal western whiptail (*Aspidoscelis tigris stejnegeri*)	○
Two-striped garter snake (*Thamnophis hammondii*)	○
Birds	
Cooper's hawk (*Accipiter cooperi*)^	✓
White-tailed kite (*Elanus leucurus*)^	○
House finch *(Carpodacus mexicanus)*	✓
Mourning dove *(Zenaida macroura)*	✓
Rock dove *(Columba livia)*	✓
Common raven *(Corvus corax)*	✓
Nuttall's woodpecker (*Picoides nuttallii*)	●
Loggerhead shrike (*Lanius ludovicianus*)^	○
Least Bell's vireo (*Vireo bellii pusillus*)	-
Coastal California gnatcatcher (*Polioptila californica californica*)^	✓
Northern mockingbird (*Mimus polyglottos*)	●
Yellow warbler (*Dendroica petechia brewsteri*) ^	○
Yellow-breasted chat (*Icteria virens*)^	○
Common yellowthroat (*Geothypis trichas*)	●
Wilson's warbler (*Wilsonia pusilla*)	●
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens)*^	○
Mammals	
Botta's pocket gopher (*Thomomys bottae*)	●
California ground squirrel (*Spermophilus beecheyi*)	●
Brush rabbit *(Sylvilagus bachmanii)*	●
San Diego desert woodrat (*Neotoma lepida intermedia*)^	○
Raccoon *(Procyon lotor)*	✓
Gray fox (*Urocyon cinereoargenteus*)	○
Coyote *(Canis latrans)*	✓
^Sensitive species	

Invertebrates observed by both Dudek and Chambers Group included cabbage white, common white, painted lady, buckeye, and mourning cloak. Additional species found by Dudek included funereal duskywing (*Erynnis funeralis*), tiger swallowtail (*Papilio rutulus*), California dogface (*Colias eurydice*), Behr's metalmark (*Apodemia mormo virgulti*), southern (silvery) blue (*Glaucopsyche lygdamus*), Acmon blue (*Plebejus acmon*) and Lorquin's admiral (*Limenitis lorquini*).

One species of amphibian, Pacific treefrog, was observed during Dudek surveys. Western spadefoot toad (*Spea hammondii*), a CSC, was determined to have a moderate potential to occur, although it was not observed (Dudek, 2005).

Dudek did not report observation of any reptile species during their 2005 surveys. One CSC reptile, the two-striped garter snake (*Thamnophis hammondii*), was determined to have a moderate potential to occur within Buck Gully (Dudek, 2005). Two CSC reptiles were determined to have a high potential to occur: orange-throated whiptail (*Aspdoscelis hyperythra*) and coastal western whiptail (*Aspidoscelis tigris stejnegeri*) (Dudek, 2005).

Four bird species in the middle reach of Buck Gully were found exclusively during the Dudek surveys, including Nuttall's woodpecker (*Picoides nuttallii*), northern mockingbird (*Mimus polyglottos*), common yellowthroat (*Geothypis trichas*), and Wilson's warbler (*Wilsonia pusilla*). Six of the bird species were observed in Buck Gully by both Dudek and Chambers Group in 2005, including house finch, mourning dove, rock dove, common raven, coastal California gnatcatcher, and Cooper's hawk. Both coastal California gnatcatcher and Cooper's hawk are CSC, in addition, coastal California gnatcatcher is a federally-listed threatened species. Four other CSC species, yellow warbler (*Dendroica petechia brewsteri*), yellow-breasted chat (*Icteria virens*), loggerhead shrike (*Lanius ludovicianus*), and southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) were determined to have a moderate potential to occur (Dudek, 2005). One California Department of Fish and Game fully protected species, white-tailed kite (*Elanus leucurus*), was also determined to have a moderate potential to occur (Dudek, 2005). State- and federally-listed Least Bell's vireo was not detected (Dudek, 2005).

Raccoon and coyote were observed during both the Dudek and Chambers Group surveys in 2005. In addition, Dudek reported observation of Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Spermophilus beecheyi*), and brush rabbit (*Sylvilagus bachmanii*) (Dudek, 2005). San Diego desert woodrat (*Neotoma lepida intermedia*), a CSC, was also determined to have a moderate potential to occur due to the presence of a midden within the survey area.

2.6 Urban Runoff Characterization

2.6.1 Pollutants of Concern

The Newport Coastal Watershed faces some significant challenges as identified through a number of special studies recently undertaken by the City of Newport Beach. Further details of these investigations are provided in this section. The key challenges identified included elevated metal concentrations in the water (including copper and cadmium) and the presence of elevated indicator bacteria and elevated sediment loads.

The Newport Coast Flow & Water Quality Assessment: The Newport Coast Flow & Water Quality Assessment project was a one-year study, begun in 2005, of the coast canyon streams in the Newport Coast Watershed. Samples were collected during two dry weather sampling events, three wet weather sampling events, and during a source identification study of Buck Gully. From these investigations, flow was estimated and water quality was analyzed in the canyon creeks for total and dissolved metals, pesticides, nutrients, bacteria indicators, and general water chemistry parameters. The results of the assessment indicate that water quality conditions within the coastal canyons are generally protective of the beneficial uses of the watershed, which include water contact recreation (REC-1), non-contact recreation (REC-2), municipal and domestic supply (MUN), and warm freshwater habitat (WARM), except for three constituents: fecal indicator bacteria, dissolved cadmium, and dissolved copper. Diazinon was also detected at concentrations above the water quality objectives (WQO) in one sample. The bacterial water quality criteria are based on recreational uses of the creeks and the ocean. The dissolved metals criteria are based on the California Toxic Rule, which relates risk to potential ecological receptors in the receiving waters.

Fecal Indicator Bacteria

Fecal indicator bacteria (fecal coliform and enterococci) were the most widely detected constituents and those most frequently detected at levels above their respective WQOs in the coastal canyons during both dry and wet weather sampling (Figure 2-14). The fecal coliform concentrations detected in the freshwater samples were compared to the more conservative WQO of 400 MPN/100mL, the maximum allowed for 10 percent of the samples during a monthly sampling period, per the Santa Ana Basin Plan. Although the SARWQCB Basin Plan does not establish WQO for enterococci, the concentrations of enterococci bacteria were compared to the Ocean Plan WQO of 104 MPN/100mL.

Fecal coliform bacteria were detected at levels above the WQO in each of the coastal canyons sampled in multiple storm events, as well as in Pelican Point (PP1), Upper Los Trancos (LTU), and Muddy Creek (MCC) during dry weather. The highest concentrations of bacterial indicators were observed during wet weather events, and generally for the first storm event. These results may indicate a possible first flush phenomenon.

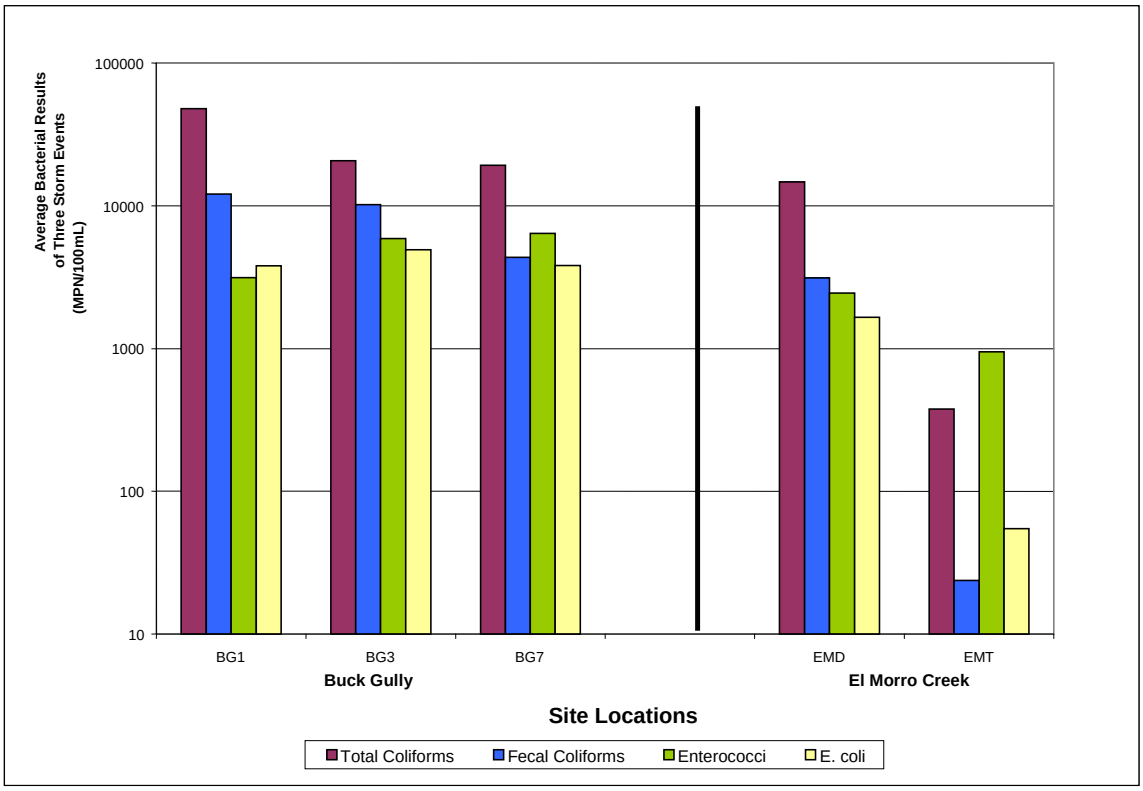

Figure 2-14: Bacterial Concentrations Found During Wet Weather at Buck Gully and El Morro Canyon

Enterococci were detected at concentrations above the WQO in dry weather samples collected from three locations in Buck Gully and nearly all the other canyon creek sampling locations. Concentrations of enterococci were highest at Pelican Point (PP1) during dry weather. Exceedances were indicated at all the canyons for the wet weather samples, with the highest concentrations generally observed for the first storm event. Similar wet weather results were also indicated for total coliform.

Metals

Cadmium and copper were the most frequently detected dissolved metals within the Newport Coast Watershed's canyon creeks (Figure 2-15). Metals concentrations detected in the freshwater canyon creeks were compared to the California Toxic's Rule (CTR), which lists hardness-based WQOs for the total and dissolved recoverable forms of arsenic, cadmium, chromium III, copper, lead, mercury, nickel, silver, and zinc. Although the CTR has criteria for both total and dissolved metals, the WQOs for freshwater are based on dissolved metals, which are generally more bio-available to potential ecological receptors.

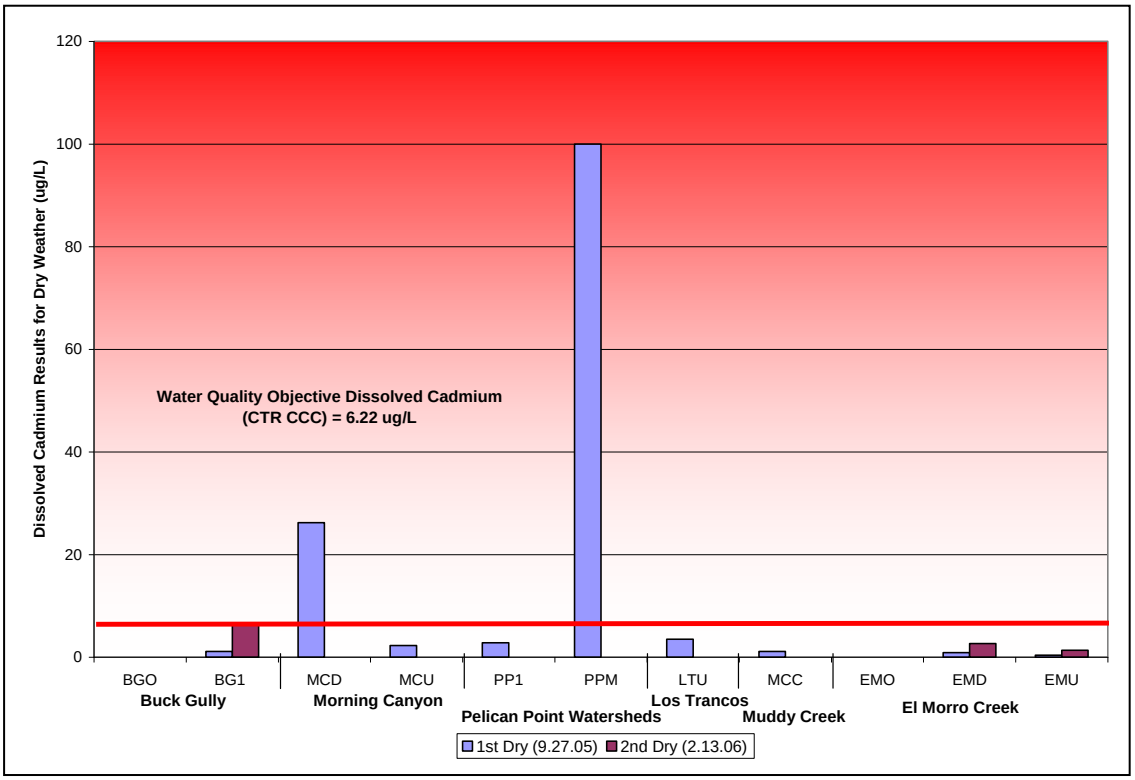

Figure 2-15: Dissolved Cadmium Results during Dry Weather Sampling in the Newport Coast Watersheds

Dissolved cadmium was detected at levels above the WQO in both wet and dry weather flows in Pelican Point Middle Creek (PPM) and Morning Canyon Downstream (MCD). Dissolved cadmium was detected at levels above the WQO within two other creeks during either dry or wet season sampling: Buck Gully at sites BG1 and BG3 during dry weather sampling, and at the mouth of Pelican Point Waterfall Creek during wet weather sampling. In comparing the concentrations of dissolved cadmium detected in the Newport coastal canyons to concentrations reported regionally, the concentrations detected in Morning Canyon and Pelican Point dry and wet weather samples are an order of magnitude and greater compared to the mean concentrations reported for the San Diego, Santa Ana Delhi and Laguna Canyon Creek (City of Laguna Beach 2006).

The concentration of dissolved copper was also detected above its WQO in both wet and dry weather samples. There was one dry weather exceedance at the Pelican Point Middle Creek (PPM) site for dissolved copper. Exceedances of the WQO were indicated in wet weather samples from Pelican Point (PP1) and upper Morning Canyon (MCU).

Although the freshwater criteria are based on the dissolved metal fraction that is bio-available to potential ecological receptors, a comparison of the CTR for total metals was also performed. The results of this comparison concluded that the predominant exceedance of the metals criteria was for total cadmium in both dry and wet samples from Buck Gully, Morning Canyon and Pelican Point watersheds. Exceedances of the metals criteria were also indicated for total copper and zinc in wet weather samples from Morning Canyon and Pelican Point (PP1 & PPW) creeks.

2.6.2 Pollutant Sources

2.6.2.1 Watershed-Wde

The results of the assessment indicate that water quality conditions within the coastal canyons are generally protective of the beneficial uses of the watershed except for fecal indicator bacteria, dissolved cadmium, and dissolved copper.

The sources of the bacterial exceedances have not been specifically identified but the results indicate both natural and anthropogenic sources. The concentrations of bacteriological indicators at the downstream location in El Morro Canyon exceeded the WQOs at least once for total coliforms, fecal coliforms and enterococci during the storm events. El Morro Canyon is approximately 95% undeveloped, with the exception of a trailer park and the Pacific Coast Highway at the mouth of the creek. Samples were also collected above the trailer park, which resulted in one exceedance for enterococci during one storm event. These results suggest both anthropogenic and non-anthropogenic sources of bacteria contributing to the exceedances in this and other coastal canyon watersheds. In addition, the analysis of estimated total annual loads indicated the total dry and wet weather annual loads for fecal coliform are of the same magnitude for furthest downstream sampling point at both Buck Gully (the most developed watershed) and El Morro (least developed). The estimated annual wet weather loading for enterococci at Buck Gully was, however, an order of magnitude higher than the load at the reference site (El Morro) for the modeled flows, and even significantly higher when the instantaneous flow measurements are used for loading estimates. There is greater potential for anthropogenic sources of bacteria in Buck Gully than the reference canyon.

Within the Newport coastal canyon watersheds, it can be reasonably assumed that the vast majority of metals contributed to the canyon creeks and ocean are from non-point sources. There are no direct discharges from wastewater treatment plants, industry, or groundwater treatment facilities within these watersheds. Potential non-point sources of heavy metals in urban runoff based on a study conducted in Santa Clara California concluded that urban runoff from roads was the largest contributor (Woodward-Clyde, 1998). The metals from roadway runoff included cadmium (tires), copper (brakes and tires), lead (brakes, tires, fuels and oils) and zinc (tires, brakes, auto frame). Secondary contributors of metals to watersheds were cited to include contaminated sediments, atmospheric depositions and miscellaneous sources, such as antifouling paints from boats. All these non-point sources of heavy metals including cadmium and copper exist in the Newport coastal canyon watersheds.

As described above, the source of cadmium in wet and dry weather flows was not identified, but could be from both natural and anthropogenic sources. For example, concentrations of dissolved cadmium detected in the reference (El Morro) canyon dry weather samples ranged from 0.87 to 2.67 µg/L. If the average of these reference concentrations were subtracted from the concentrations of 6.39 and 6.23 µg/L detected at Buck Gully BG1 and BG3, respectively, the CTR criteria of 6.22 µg/L would not be exceeded. The magnitude of the exceedances at Pelican Point Middle Creek and Morning Canyon are, however, much higher and suggest potential anthropogenic sources.

In addition to these predominant sources; cadmium is also found in some fertilizer, primarily phosphate fertilizers (OECD, 1994; ERL, 1990), and from composts applied to plants and

grasses (Ingram, 2006). The EPA also states that cadmium salts have had a very limited use as a fungicide for golf courses and home lawns (EPA, 2006). It is not known what type of fertilizer, or if compost, is used by the golf courses that are located within the Buck Gully, Morning and Pelican Point watersheds. Metal roofing has also been identified as a source of cadmium (Van Metre & Mahler, 2003). Cadmium also occurs naturally in zinc, lead, and copper ores.

Sources of copper in water include corrosion of copper pipes in the interior of residences and other buildings. Possible natural sources of metals are forest fires, decaying vegetation, and sea spray (Lenntech, 2006).

2.6.2.2 Buck Gully

The overall conclusion of the dry weather source identification program within Buck Gully was that the dry weather flows observed in Buck Gully were not predominantly from direct urban runoff, but rather from groundwater seepage into the stream channel from either alluvial deposits along the stream bed and/or from groundwater discharges where the channel cuts below the groundwater table. This conclusion is consistent with the Groundwater Seepage Study which concluded that a significant portion of the base flow was from groundwater seepage as a result of infiltration of imported irrigation waters.

The findings from the dry weather source investigation at Buck Gully indicated the largest relative flow was found in a drainage channel that enters the creek between Spyglass Ridge Community (BG3) and the outlet structure at Fifth and Poppy Streets (BG4). The drainage channel collects urban runoff from the sub-drainage area that includes a portion of the Pelican Hill Community. This flow was also the source with the highest nitrate and phosphate values. The residences within this sub-drainage area also correspond to properties identified with higher water consumption than the communities to the north. This community has been identified by the City for promotion of the use of smart irrigation systems to lower water consumption. A decrease in irrigation within this community will reduce dry weather flows in Buck Gully and is expected to improve overall water quality in the receiving channel and in the ASBS. Based on the Draft Groundwater Seepage Study, the use of imported water for irrigation has resulted in a groundwater mound in Buck Gully, Morning Canyon and Pelican Point watersheds. Reduction of irrigation would reduce infiltration and lower the groundwater mound, resulting in lower contributions to groundwater seeps and dry weather flows in the lower portions of the canyons.

Another source found in the section between BG3 and BG4 was at the catchment basin at Poppy Lane and 5th Avenue. Continuous discharge of water was found at this site. The water quality results here are lower for nitrate and phosphate, but had the highest ammonia value (2.0 ppm). The City has also targeted the Fifth and Poppy streets discharge for upgrades and diversion and treatment of dry weather flows in 2007.

Although these sources were identified in the investigation, the statistical results of the water usage and the estimated loads for metals (cadmium, copper and zinc) and bacteria in Buck Gully indicated a strong relationship between the sub-drainage area water use and total loads. The conclusion from these results is that a relationship exists between high water usage within a sub-drainage area and the calculated loadings for constituents that were observed to exceed WQO in wet and dry weather samples.

3.0 AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE (ASBS)

This section describes the Areas of Biological Significance in the Newport Coast watershed, together with descriptions of the studies currently underway to better understand the impact of the watershed and surrounds on the marine environment.

3.1 Description of ASBS

The Newport Coast Watershed coastline has two Area of Special Biological Significance (ASBS) designations; the Newport Beach (Robert E. Badham) Marine Life Refuge (ASBS No. 32) and the Irvine Coast Marine Life Refuge (ASBS No. 33) (Figure 3-1).

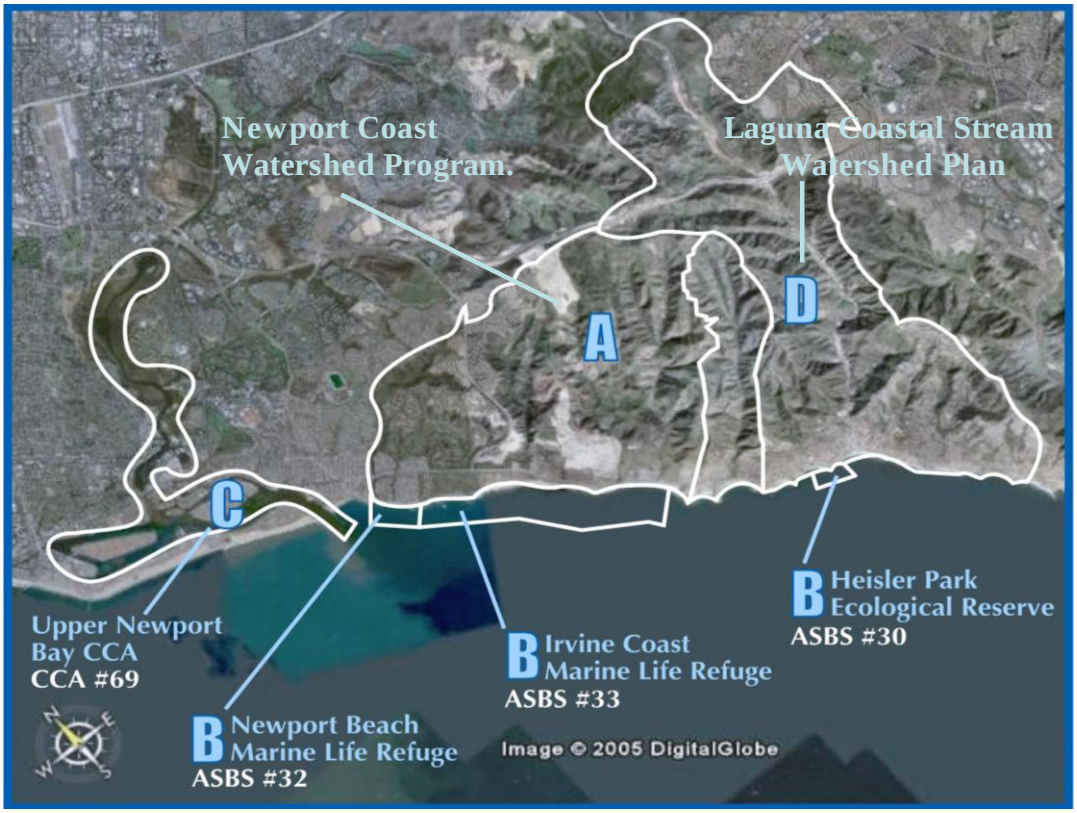

Figure 3-1: Newport Coast ASBS

Newport Beach Marine Life Refuge (ASBS #32) is located at the base of Poppy Avenue in Corona del Mar. Newport Beach Marine Life Refuge ASBS is located just south of Newport Harbor. The refuge begins at the shoreline between Poppy Avenue and Cameo Shores Road and extends out into the ocean to the 100-foot isobath or 1,000 feet distance from shore, whichever is greater. The northern end of the refuge contains a wide sandy beach and is a heavily used recreation area, while the southern end primarily consists of rocky tide pools surrounded by coastal bluffs (Weston Solutions, 2006b). This site also has a sandy bottom offshore habitat with kelp forests (Marine Managed Areas Inventory, 2006a). It is the receiving water for two natural streams (Buck Gully and Morning Canyon Creek) in addition to 19 other points of drainage discharge connected to the MS4 system or private drainage conduits.

The Irvine Coast Marine Life Refuge (ASBS #33) is located between the Newport Beach Marine Life Refuge and the Laguna Beach city limit, along 3.3 miles of coast (Weston Solutions, 2006b). It has an offshore boundary of the 100-foot isobath or 1,000 feet distance from shore, whichever is greater. The shoreline of this site consists of rocky platforms and headlands interspersed with sandy beaches (Marine Managed Areas Inventory, 2006b).

The City is taking pro-active steps to preserve and enhance the ASBS. The City is working with the SWRCB to control direct stormwater discharges (e.g., private drains and municipal v-ditches) to the beach. Dry weather and storm flows from the coastal canyons are being monitored to assess if there are particular pollutants whose contaminant loading would pose a potential impact to the health of the ASBS. Other stressors to the system also being evaluated include impacts from public use and potential cross contamination impacts from Newport Bay. A runoff reduction program has been initiated to reduce over-irrigation practices and wash-down activities. The runoff-reduction program includes an innovative program to encourage the use of Smartimer Irrigation Controllers. As of August 2007, over 500 controllers have been installed. Initial monitoring results show water usage reduction of 35 to 40 percent. Canyon flow monitoring will be initiated to check if there is a corresponding reduction in canyon flows.

Figure 3-2: Newport Beach Marine Life Refuge

3.1.1 Beneficial Uses

The Little Corona Tide Pool rocky intertidal area within the Newport Beach Marine Life Refuge ASBS is used by a large number of tide pool visitors as well as for shore fishing, spear fishing, SCUBA diving, and other commercial and sports fishing purposes. An in-depth investigation into the number of visitors and their impact on the ASBS is currently being conducted as part of the special studies associated with the ASBS and is described in further detail in Section 3.2.1.

Figure 3-3: Public Impact from Rock Pooling

The Santa Ana Regional Board designates a number of beneficial uses for the Newport Coast Watershed (Table 3-1). The City is committed to protecting the beneficial uses (designated in the California Ocean Plan, 2005) as evidenced by its work to implement the Newport Coast WMP, the ASBS Protection Plan and a Harbor Area Management Plan.

Table 3-1: Summary of Beneficial Uses in Newport Watershed (Source: SARWQCB Basin Plan)

	MUN	ARG	IND	GWR	NAV	POW	REC-1	REC-2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST
OCEAN WATERS																			
ASBS					X		X	X					X				X		
Newport Bay					X		X	X	X									X	
INLAND SURFACE STREAMS																			
Buck Gully		X		X						X	X								
Morning Canyon		X		X						X	X								
Pelican Point		X		X						X	X								
Pelican Point Middle Creek		X		X						X	X								
Los Trancos		X		X						X	X								
Muddy Canyon		X		X						X	X								
El Morro				X						X		X	X			X			

Table 3-1: Continued.

MUN	Municipal and Domestic Supply (**MUN**) waters are used for community, military, municipal or individual water supply systems. These uses may include, but are not limited to, drinking waters supply.
ARG	Agricultural Supply (**AGR**) waters are used for farming, horticulture or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.
IND	Industrial Service Supply (**IND**) waters are used for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.
PROC	Industrial Process Supply (**PROC**) waters are used for industrial activities that depend primarily on water quality. These uses may include, but are not limited to, process water supply and all uses of water related to product manufacture or food preparation.
GWR	Groundwater Recharge (**GWR**) waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality or halting saltwater intrusion into freshwater aquifers.
NAV	Navigation (**NAV**) waters are used for shipping, travel or other transportation by private, commercial or military vessels.
POW	Hydropower Generation (**POW**) waters are used for hydroelectric power generation.
REC-1	Water Contact Recreation (**REC1** *) waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, whitewater activities, fishing, and use of natural hot springs.
REC-2	Non-contact Water Recreation (**REC2** *) waters are used for recreational activities involving proximity to water, but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.
COMM	Commercial and Sportfishing (**COMM**) waters are used for commercial or recreational collection of fish or other organisms, including those collected for bait. These uses may include, but are not limited to, uses involving organisms intended for human consumption.
WARM	Warm Freshwater Habitat (**WARM**) waters support warm water ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
LWRM	Limited Warm Freshwater Habitat (**LWRM**) waters support warm water ecosystems which are severely limited in diversity and abundance as the result of concrete-lined watercourses and low, shallow dry weather flows which result in extreme temperature, pH, and/or dissolved oxygen conditions. Naturally reproducing finfish populations are not expected to occur in **LWRM** waters.
COLD	Cold Freshwater Habitat (**COLD**) waters support coldwater ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
BIOL	Preservation of Biological Habitats of Special Significance (**BIOL**) waters support designated areas or habitats, including, but not limited to, established refuges, parks, sanctuaries, ecological reserves or preserves, and Areas of Special Biological Significance (ASBS), where the preservation and enhancement of natural resources requires special protection.
WILD	Wildlife Habitat (**WILD**) waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.
RARE	Rare, Threatened or Endangered Species (**RARE**) waters support habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law as rare, threatened or endangered.
SPWN	Spawning, Reproduction, and Development (**SPWN**) waters support high quality aquatic habitats necessary for reproduction and early development of fish and wildlife.
MAR	Marine Habitat (**MAR**) waters support marine ecosystems that include, but are not limited to, preservation and enhancement of marine habitats, vegetation (*e.g.*, kelp), fish and shellfish, and wildlife (*e.g.*, marine mammals and shorebirds).
SHEL	Shellfish Harvesting (**SHEL**) waters support habitats necessary for shellfish (*e.g.*, clams, oysters, limpets, abalone, shrimp, crab, lobster, sea urchins, and mussels) collected for human consumption, commercial or sports purposes.
EST	Estuarine Habitat (**EST**) waters support estuarine ecosystems, which may include, but are not limited to, preservation and enhancement of estuarine habitats, vegetation, fish and shellfish, and wildlife, such as waterfowl, shorebirds, and marine mammals.

3.1.2 Critical Coastal Area

The two ASBS within the watershed each have Critical Coastal Area (CCA) designations for the associated adjacent land. The Newport Beach Marine Life Refuge (CCA #70) and the Irvine Coast Marine Wildlife Refuge (CCA #71, shared with Region 9) are designated areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable (RWQCB, 2004). The California Ocean Plan states that point and non-point source discharges of waste into these areas are prohibited.

3.2 Current Special Studies in the ASBS

The City is currently broadening its understanding of the impacts to the ASBS through a number of scientific investigations to better understand the complex marine environment and its interconnectivity to other coastal watersheds, and various impacts to the marine environment and its inhabitants. The key study components include:

- Public impact surveys
- Intertidal monitoring
- Bioaccumulation studies
- Analysis of potential cross contamination from Newport Bay
- Rockweed restoration pilot project
- ASBS Impact metric

These are described in more detail in the sections below.

3.2.1 Public Impact

The objective of the Public Use Surveys is to:

- Identify the types of human activities within ASBS areas
- Identify the degree to which visitor use affects marine resources within ASBS area
- Identify the relative importance of visitor use-related impacts compared with constituent loading from wet and dry weather runoff as well as contributions from migration of constituents from adjacent watersheds (i.e., constituent loading from dry and wet weather flow and cross contamination from tidal flows from Newport Bay and coastal watershed inputs
- Identify techniques and methods that can be used by the City of Newport Beach and the City of Laguna Beach (Cities) in the implementation of long-term ASBS monitoring surveys.

The methods used in the study are based on previous visitor use effect studies conducted in the intertidal zones of Santa Monica Bay and the Orange County shoreline. Generally, use surveys quantify intensity by observing the numbers of groups and/or the total number of individuals and their activities within the sandy shoreline and rocky intertidal habitat. Habitats where people are observed collecting from, or disrupting, habitat are identified and the frequency of the following activities are recorded:

- tide pooling
- trampling activities
- collecting (food, bait collecting, or general)
- handling/returning organisms to rocks

- rock overturning
- SCUBA diving and snorkeling
- spear fishing
- shore fishing
- party boat fishing
- commercial fishing
- enforcement activities

This investigation is currently being conducted and the results will be used to assess the impact of public use on the ASBS in order to better manage the near-shore coastal marine environment. Preliminary results suggest that public use has a significant impact on tidal areas within the ASBS, particularly at Heisler Park and Corona Del Mar. Methods to address this are presented in Section 6.3.

3.2.2 Cross Contamination

Under a separate study undertaken in 2007 and 2008, Everest International Consulting is using numerical methods to understand the transport of contaminant loads from Newport Bay to the ASBS. This work involves a historical review of pollutant measurements in the Bay and research on the sensitivity of ASBS species to particular pollutants. Computer modeling will be used to assess circulation and dilution effects of Bay pollutant sources to the ASBSs. See Section 3.2.6 Circulation for preliminary findings.

3.2.3 Intertidal Monitoring Survey

By examining the distribution and abundance of species located within the ASBS through intertidal monitoring surveys, it is possible to identify the most important stressor of the potential causes of impacts within the ASBS. Intertidal monitoring surveys aim to determine the types of anthropogenic impact effects on species present in ASBS and to create a base-line in which to monitor change due to further impacts or effectiveness of recovery actions. The Baseline Intertidal Monitoring Surveys will identify the presence, abundance and distributions of species by conducting initial biannual surveys along permanent transect lines stratified by habitat type and tidal level following methods comparable to other long-term monitoring programs. The Baseline survey was designed to be used to develop the Intertidal Monitoring Program that will be implemented within the ASBS. This survey is currently being conducted and will have regionally applicable results.

3.2.4 Bioaccumulation and Toxicity Studies in Mussels

Bioaccumulation of contaminants of concern in California Mussels is currently being investigated to assess the impact of watershed discharges. Mussels are filter feeders that rely on collecting organic particles from large volumes of water. Chemical contaminants, bacteria and viruses have all been found to accumulate in mussel tissue harvested from contaminated water. In this study transplanted adult mussel tissues will be analyzed for a wide-range of chemical contaminants and be compared to pre-exposure concentrations for the transplanted individuals to examine

Figure 3-4: Mussels used in Bioaccumulation Studies

site-specific uptake rates. This study will determine the integrated accumulation of bioavailable contaminants from various sources.

In addition to bioaccumulation, a subsample of the transplanted mussels will be tested using standardized toxicity tests to evaluate the success of larval development. Larvae of mussels are highly sensitive to contaminants, the successful development of zygotes to first feeding larval stages serve as sensitive surrogates for the other broadcast spawning species along the coast.

3.2.5 Experimental Restoration Program for the Rockweed *Silvetia compressa*

An experimental restoration project is currently underway headed by California State University Fullerton. The goal of this project is to experimentally investigate potential techniques to re-introduce *Silvetia compressa* into the intertidal zone at Little Corona Tide Pool where it previously existed. *S. compressa* is a good candidate for restoration for several reasons. First, it is an important microhabitat-forming species that provides food and shelter to a diverse community of invertebrates and algae. Successful restoration of this habitat-forming species may eventually lead to an increase in the abundance of other rocky intertidal populations and an increase in species diversity at the site. Second, *S. compressa* recruits within a small radius (<1 m) of the adult source population and therefore, restoration of *S. compressa* populations at Little Corona Tide Pool will most likely result in future local recruitment and population maintenance and increased overall abundance of this key species at the site. The restoration program involves seeding and relocation of juveniles. The study additionally investigates the best methods for promoting rockweed growth such as canopy presence and herbivore exclusion. The results of this investigation will be key to future restoration works in the ASBS and will form the basis for the reintroduction of other key species into the ASBS.

Figure 3-5: Rock weed at Corona Del Mar

3.2.6 Circulation Study

Understanding nearshore flow characteristics is essential to accurately describing the fate of discharge plumes originating from terrestrial and harbor sources to the marine environment. In the case of the Newport Beach coastline near Little Corona, a freshwater creek discharges across the intertidal zone and enters the surf zone. This zone is just down coast of the entrance to Newport Harbor. During heavy runoff events, the near-shore zone is inundated by a freshwater plume. In the case of Little Corona, the plume is influenced by runoff from the creeks and the harbor. The speed with which the plume dissipates to ambient levels is determined by natural rates of diffusivity, mechanical wave mixing, wind intensity and direction, tidal forcings, storm intensity, and prevailing currents.

To define the flow (velocity) field offshore of Little Corona, three RDI Workhorse Acoustic Doppler Current Profilers (ADCP) were deployed in an array. The first was placed in 6 m depth offshore of Buck Gully. The second was deployed in 11 m depth down-coast of Buck Gully near Morning Canyon, and the third was deployed in 13 m depth offshore of the south jetty of the harbor entrance. All units were anchored into position by scientist divers and left in place for

one month (27 days) when current information was recorded over 5-minute intervals during the sampling duration.

Data processing is currently underway, however preliminary data reveal a dynamic system that appears to respond predictably to known forcings (Figure 3-6). These data will also be used to verify assumptions made in a flow field model investigating the degree of influence from Newport Harbor on the nearby Newport Coast Area of Special Biological Significance (ASBS).

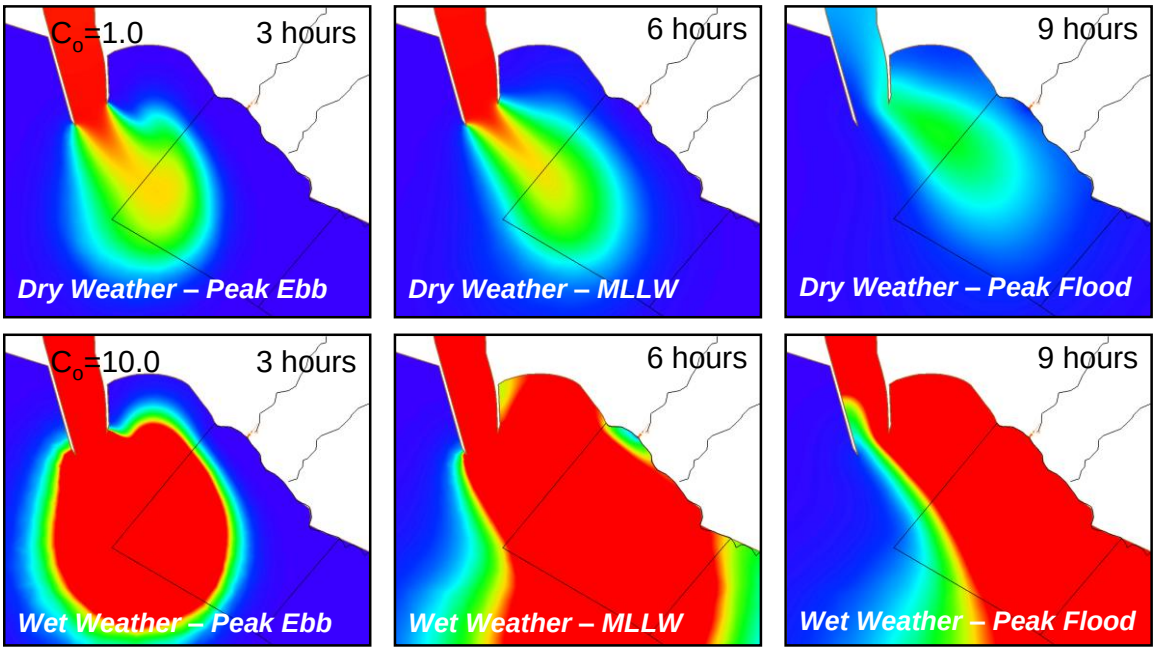

Figure 3-6: Example of Preliminary Results of Circulation Study

3.2.7 Impact Metric

Results of the special studies described above will guide the City's approach to distinguish the relative importance of impacts to the ASBS. Using the various data collected under these studies, an impact metric has been developed that defines impacts to organisms or ecological processes in ASBS. The impact metric has been designed to assign measurement criteria specific to abiotic and biotic indicators in order to detect impacts related to dry and wet weather flows, public use, cross contamination, and physical and environmental factors. Using a weight of evidence approach, the pattern of response by all of the indicators in relation to the identified impacts can be used to demonstrate the relative importance of each potential impact. The metric results will serve to both guide the prioritization of project implementation strategies as part of this WMP as well as establish a baseline from which the effectiveness watershed improvement activities can be measured.

3.3 Watershed Studies for Assessing the Impact on the ASBS

The City is taking a holistic and watershed-based approach to address discharges to the two ASBS and other potential impacts by understanding the inherent complexities of this marine

ecosystem and its connection to the upstream and adjacent watersheds, tidal currents and public use. Several studies have been undertaken to identify and quantify the watershed impacts to the ASBS.

Three significant assessments have been completed in the Newport Beach and Irvine Coast Marine Life Refuge ASBS. In 2003, Rivertech completed a four-month flow assessment at four stations in Buck Gully for the Irvine Ranch Water District (Rivertech, 2004). The assessment concluded that because the dry weather flow contribution (flow per unit area) increases downstream, the older developments, which increase in the downstream direction, generate more dry weather flow than new developments. However, one of the two upstream stations that monitors Newport Ridge, a newer development, did have "a significantly higher" dry weather flow contribution than other areas within the Buck Gully watershed. Also of interest, when looking at the daily flow data, there are waves of higher flow in the morning with lows during the night at all four stations, indicating irrigation as a possible source.

In 2005, as part of the Newport Coast Watershed Program, the City of Newport Beach contracted two year-long assessments; a groundwater seepage study and a flow and water quality assessment. Todd Engineers completed the groundwater seepage study in 2006 which included an analysis of the water balance under pre and post development conditions and a focused field program identifying indicators of groundwater seepage. In May, 2006, Weston Solutions completed the Newport Coast Flow and Water Quality Assessment. This assessment consisted of dry and wet weather flow and water quality analysis in eight coastal canyons from Buck Gully to El Morro Creek. The results from both assessments concluded the likely source of nuisance flow is from irrigation runoff and groundwater recharge.

The Southern California Coastal Water Research Project Authority (SCCWRP), in its report *Discharges into State Water Quality Protection Areas*, identified 21 potential discharges into the Robert E. Badham State Marine Park and 32 potential discharges into the Irvine Coast Marine Life Refuge (SCCWRP, 2003). Anthropogenic discharges were identified and classified into each of the following categories: municipal/industrial storm water point sources, small storm drain point sources, and non-point sources. Naturally occurring streams and gullies which enter into the refuges were also identified. Each discharge and outlet classification was defined by SCCWRP personnel using their best professional judgment. Municipal/industrial storm water point sources were defined as those appearing to serve multiple properties and that also appear to be maintained and/or operated by a municipality or other governmental entity.

Municipal storm drains, small storm drains (defined as those drains that appear to serve individual residential or commercial properties or small clusters of properties), small access/service roads, or developed landscaped areas, were identified. Non-point source discharges were defined as agricultural discharges, sheet flow from roads, parking lots, stairways and ramps, and erosion/gully formation, with subsequent downstream sediment deposition due to roads or trails in parks or wild areas.

3.4 Long-Term Ocean Ecosystem Monitoring Program

The outcomes of the monitoring program will be used to address the project goals and questions and to develop a Long-Term Effectiveness Assessment/Mitigation Monitoring Plan. This in turn will define the long-term program strategy and the program goals to be measured. The results

obtained from the public use, cross-contamination from Newport Bay study, biological survey, bioassay and renovation monitoring will be analyzed using the "Impact Metric" to assess the relative impact to the ASBS from various sources. These sources include dry weather flows, stormwater, public use, cross tidal contamination and environmental changes.

Success of the Long-Term Effectiveness Assessment/Mitigation Monitoring Plan depends on implementing a monitoring plan that can be applied by various groups throughout southern California, provides data that will permit the identification of adverse impacts within ASBS environments, provides a structure within the data collection that will permit correct identification of the cause of an adverse impact within the targeted ASBS rocky intertidal environments, and allows monitoring of the success of any pilot or full scale restoration efforts that are undertaken. Monitoring programs by definition involve the repeated sampling of measured parameters over time and space. The fundamental approach to biological monitoring includes the following key elements: the biological monitoring program must be carried out over long periods and designed so as to account for natural variability in the biological system; the program must be designed using the best available ecological concepts, study designs, and principles; data must be collected in a consistent and well documented manner to achieve required continuity and reliability; and, the program should be designed so that the detection of change and impacts can be statistically based.

3.5 Summary of Impacts

Through the key scientific projects described in this section and the understanding of current conditions in the watershed it is possible to summarize the most significant impacts from the coastal watershed. These watershed impacts are illustrated in Figure 3-7 and include:

- increased urban runoff from dry weather flow and impervious surfaces
- runoff containing constituents of concern such as bacteria and metals
- erosion with high associated sediment loads
- increased fire risk with impact on residential and habitat loss
- lack of community access to public lands
- cross contamination from Newport Bay and other sources
- the impact of public use on coastal near shore communities

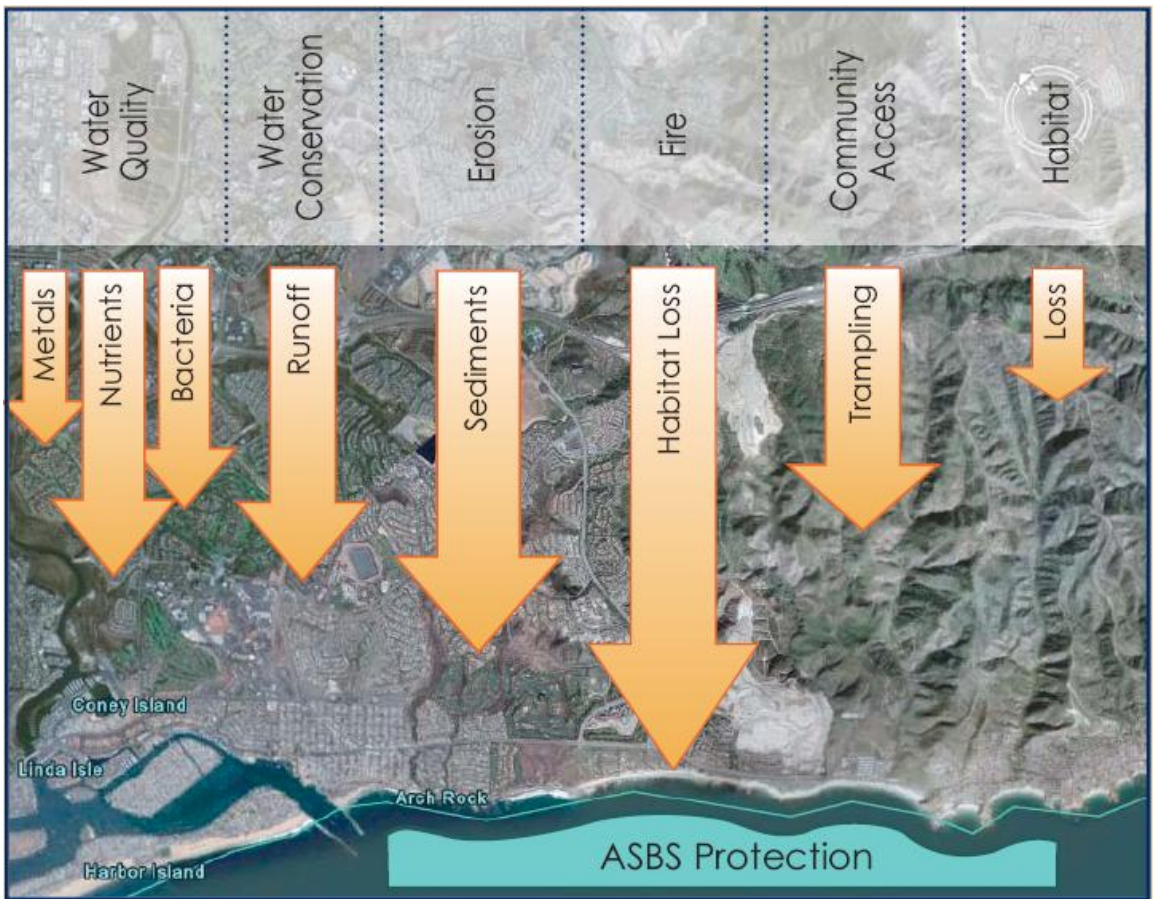

Figure 3-7: Key Issues Identified in the Newport Watershed

4.0 IMPLEMENTATION GOALS AND OBJECTIVES (Activities/Action Items and Priorities)

This section describes the integrated approach the City has taken to implementing the goals of objectives identified for the watershed.

Together, these implementation goals and objectives will enable the Newport Coast Watershed Management Program to reduce negative impacts to the Marine Life Refuge Areas, stabilize and restore the watershed canyons and create the groundwork for an adaptive watershed restoration and maintenance program through educational and training programs for civil servants, private citizens and special interest groups.

4.1 City of Newport Beach Goals and Regional Goals

The Newport Coast Watershed is a unique region with ASBS, CCA and complex coastal canyon habitats, along with high-end residential developments. The City of Newport has a long-term vision to create a sustainable watershed within the next 20 years. Specific goals to reach this long-term vision include:

- Enhancing Fire Prevention

- Improving Water Quality
- Protecting Canyon Stability
- Protecting Areas of Special Biological Significance (ASBSs)
- Managing Habitat and Biological Resources
- Promoting Water Conservation
- Enhancing Community Recreational Resources

An important consideration this Watershed Management Program is to ensure that the goals of the Newport Coast Watershed complement the goals of the Newport Bay Watershed, of which the Newport Coast Watershed is a part. The preliminary goals identified in the Newport Bay Watershed Management Plan emphasize:

- Improving Water Supply and Conservation
- Improving Flood Management
- Improving Water Quality
- Implementing Ecological Restoration and Maintenance Programs

Four of the City's goals: Improving Water Quality, Protecting ASBSs, Managing Habitat and Biological Resources and Promoting Water Conservation, are directly associated with the larger regional goals.

Further discussion on the City's goals follows.

4.2 Identified Challenges

4.2.1 Enhancing Fire Prevention

With increased private landscaping adjacent to canyons, over irrigation and the rise in invasive plant species, many areas of the watershed are now at risk from fire. This threat, in its catastrophic nature, would impact both human and ecological habitats and cause wide spread and long term damage. Key areas in the watershed have been identified as needing fuel modification strategies to remove potential fuel sources, and hence fire risk.

4.2.2 Improving Water Quality

Water quality in the watershed is impacted with metals (cadmium and copper), bacteria (as identified through indicator bacteria) and sediments. Dry weather runoff is also an issue caused by over irrigation of landscaping. This causes an increase in groundwater levels which in turn causes recharge into the canyons. Runoff reduction programs are therefore a key control mechanism in this Watershed Management Program.

Continued dry weather and wet weather (storm event) water quality monitoring is essential to identify potential point sources, determine current trends and to predict future loadings of potential contaminants of concern. Dry weather monitoring, conducted as part of the Municipal Storm Water Illicit Discharge Elimination Program, throughout each of the canyons of the watershed is integral in identifying processes to reduce nuisance flow and maintaining BMPs designed to eliminate dry weather flows from potentially discharging to the coastal canyons or Newport Coast and Irvine Coast Marine Life Refuges ASBSs.

An understanding of current water quality trends would assist the City to identify project areas requiring either pollution prevention or treatment Best Management Practices (BMPs) as well as to identify areas where BMPs may not be necessary. In addition, understanding water quality trends and how they may relate to current land use would enable modeling of future water quality conditions given proposed land use development projects. This knowledge would enable regulatory agencies to recommend BMPs to be installed during development to reduce any potential impact future development may have on the water quality.

In addition, continued characterization of the water quality throughout all the coastal canyons would assist in understanding the relationships surface runoff, and subsequent discharge from the canyon watersheds, may have on the Newport Coast and Irvine Coast Marine Life Refuges ASBS.

4.2.3 Protecting Canyon Stability

The natural process of sediment transport through the canyon streams to the coastline has been altered by anthropogenic activities. Increased development and subsequent runoff tends to accelerate the process of sediment transport during periods of increased dry and wet weather flow. Removal of natural vegetation further accelerates sediment erosion along canyon slopes. The natural process of sediment transportation through the watersheds is just as critical as the ultimate deposition of these sediments onto the beaches and coastline of the Newport Coast ASBS. However, elevated suspended sediment levels during storm discharge events may also be detrimental to the marine communities.

4.2.4 Protect ASBS

One of the most treasured, and regulated, aspects of the Newport Coast is the presence of a number of protected marine habitats. The impacts on these marine environments is complex and diverse with influences from off-shore, adjacent coasts (such as the Newport Bay and Harbor areas) and the adjacent watershed (Buck Gully). A series of special studies are currently underway to quantify the influence of these different impacts on ASBS. Preliminary indications suggest that significant impacts include the high public usage, natural phenomenon and cross contamination from the adjacent Newport Harbor.

4.2.5 Manage Habitat and Biological Resources

Much of the natural habitat in the Newport Beach Coastal Watershed is threatened by the invasion of non-native species associated with landscaping practices and increased irrigation. A key component of this management plan incorporates habitat improvement through the removal of invasive plant species.

Preservation of native habitat and biological resources is necessary to maintain and increase the viability, diversity, health and function of the watershed's ecological systems. Habitat preservation provides essential benefits such as maintaining or improving water quality, visual resources (aesthetics), and recreational and educational opportunities.

Maintaining healthy ecosystems, comprised of native flora and fauna, ultimately reduces the ability of invasive species to cause negative impacts to water quality and other beneficial uses. The management strategy for the preservation of native habitat and biological resources should include elements of the U.S. Forest Service strategy for the control of invasive species, which incorporates prevention; early detection and rapid response; control and management; and rehabilitation and restoration programs. The programs identified above are integral in developing a community-wide approach to preventing the spread of invasive species.

4.2.6 Promoting Water Conservation

Newport Beach currently imports a large proportion of its potable water. This puts an added strain on the natural resources of both Newport and adjacent communities. Better water conservation would mitigate the water quality and erosion issues discussed above as well as aiding water conservation efforts. Over irrigation has also been implicated in the addition fire risk in canyons since irrigation has lead to the growth of many nuisance plants.

4.2.7 Enhancing Community Recreational Resources

Lack of public awareness and understanding of impacting practices has lead to many of the issues the City currently faces, (such as over irrigation and use of pesticides). In order to remedy this increased public education will be required. Outreach will also be needed to educate commercial organizations such as landscapers, mobile services (such as carpet cleaners), garden centers and golf courses. In addition, public access to many parts of the ASBS and canyons is limited, which leads to increased trampling and erosion. Trail improvements will be needed to mitigate this. Another highlighted issue has been public impact on the shoreline of the ASBS with trampling, collection and scavenging practices occurring frequently. Tide pool docent training may mitigate this.

Good environmental stewardship throughout the community is a necessary component of a successful Watershed Management Program. Increasing the community's stewardship of the watershed can be achieved by increasing the public awareness of watershed issues and public participation in watershed management. Educational outreach programs can be adapted to reach specific target audiences using a variety of media.

Public outreach programs should portray an integrated approach, similar to the approach used in developing the Integrated Coastal Watershed Management Plan (ICWMP). In other words, educational material should clearly relate how recommended best management practices not only provide benefits to the local drainage area but also provide benefits on a regional scale, such as reducing potential impacts to the Newport Coast and Irvine Coast Marine Life Refuges.

5.0 WATERSHED MANAGEMENT STRATEGIES AND INTEGRATION

A range of management strategies were developed to meet those challenges identified in Section 4.0. Projects were identified which addressed the objectives of both the regional and Newport Beach watersheds. This section presents:

- The key projects proposed through stakeholder workgroups;
- The project prioritization process;
- The prioritization of sites for project implementation;
- The results of the prioritization of both projects and implementation locations.

Figure 5-1 below illustrates the prioritization and scheduling process.

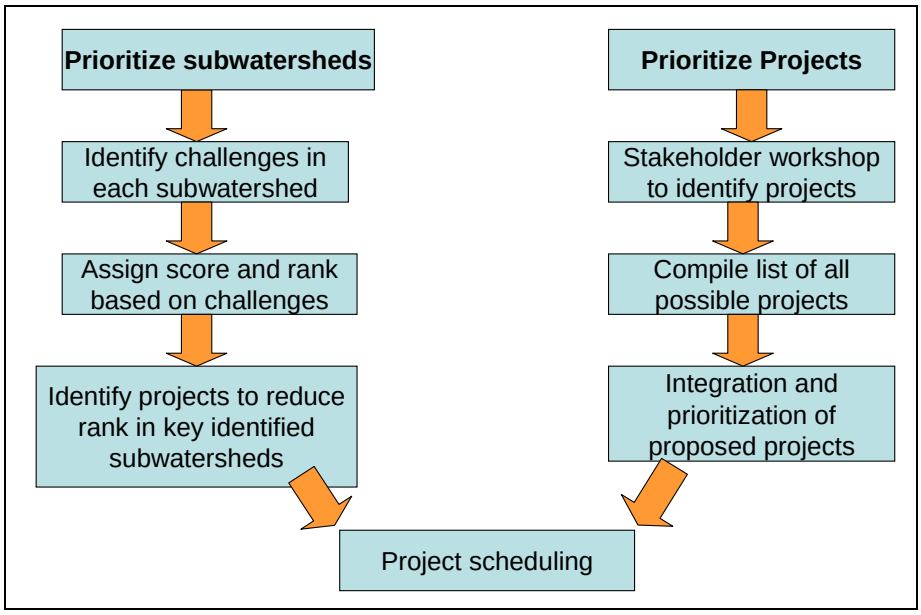

Figure 5-1: Prioritization and Scheduling Process

5.1 Identified Solutions

Many of the projects identified by stakeholders have multiple benefits and, as such, can be bundled to produce an integrated project approach. This section presents the key projects proposed for the Newport Coast Watershed. Projects were identified based on both cost analyses and an assessment of net benefits. When combined these strategies can be used to schedule priority projects cost effectively in a manner which is aligned with goals and objectives.

The full list of proposed projects, as identified by stakeholders, is presented in Appendix A.

5.1.1 Irrigation Controllers – Incentives Program

Figure 5-2: Irrigation Controller

Several actions can be taken to increase water conservation and consequently, protect the water supply. One of the key runoff reduction management practices shown to be successful within the Newport Coastal watershed has been the installation of SMART controllers, an irrigation aid which monitors water content in soil and adjusts watering practices accordingly. Installation of SMART irrigators began in 2006 and since then has been shown to be successful – out of 116 homes monitored 96 recorded a reduction in water use. The average reduction per home was over 37% with total water savings of over 450,000 gallons for the months of January and February. Due to the success of this program further irrigation controllers are proposed for other areas of the watershed.

This program would further develop the use of smart controllers in residential areas (Figure 5-2). Smart controllers have been shown to reduce water consumption by up to 40%. Implementation of Smart controllers will lead to significant improvements in water conservation. Additional benefits will include improvements to water quality in creeks and the ASBS through the reduction of contaminant transport during dry weather flows. Subsequent reductions in flow will also reduce erosion in canyons and reduce the prevalence of invasive species (since many of these species are dependant on higher water consumption than native species).

5.1.2 Community Outreach

Public outreach programs using multiple venues and media and a diversified target audience (e.g., school children, commercial business and outdoor enthusiasts), will increase the public awareness of watershed issues. Further, these programs provide the public an opportunity to become involved in maintaining and improving the health of the canyon watersheds by increasing stewardship and participation in the WMP process. Public outreach will be used to promote water conservation, raise awareness of fire prevention strategies and impacts to the ASBS. One key public outreach strategy will focus on the impacts to the ASBS where trampling and disturbance has been shown to be one of the most significant impacts to the marine shoreline. Public education can be implemented through schools, community groups and not-for-profit groups, increased signage and information kiosks. An additional project proposed for the ASBS would be the training of a tide pool docent to educate the public on the sensitive habitat of the ASBS and the impact of public trampling.

5.1.3 Habitat Enhancement

Habitat enhancement combines invasive plant removal and the replacement with drought-resistant native species. The removal of invasive plant species has multiple benefits including the reduction of erosion, the enhancement of habitat and water conservation. Replacement of invasives with native plants has multiple benefits also including restoration of habitat, erosion control and, in some cases, water quality improvements.

5.1.4 Erosion Control

A number of erosion control projects are underway or in the planning stages throughout Newport, specifically in Buck Gully. The Buck Gully Erosion Control Project involves the creation of wetland habitat, together with grade control measures. Both these measures will improve water quality in the creek and ASBS, reduce erosion and enhance habitat. Grade controls are proposed throughout the canyons at sites where erosion has been shown to impact on water quality and habitat. Grade controls reduce the high flows of water and enhance bank stabilization.

5.1.5 Street Sweeping

Street sweeping has been shown to reduce the loads of contaminants entering the waterways when implemented frequently. Advancements in sweeping technology have meant that removal of fine particulates has improved. Contaminants such as metals, solids, bacteria and trash are effectively removed through high frequency of street sweeping using vacuum assisted or regenerative air technologies. Implementation of street sweeping would benefit water quality in creeks and the ASBS.

5.1.6 Focused Dry Weather Diversions

Focused dry weather diversions can provide measurable improvements to water quality. Key sites will be identified for stormwater diversions to sewer thereby focusing resources on those diversions known o have a significant impact on the receiving waters. These structures remove the low flows from irrigation runoff and groundwater seepage and bypass them to treatment facilities thereby improving water quality.

5.1.7 Low Impact Development (LIDs)

Low impact developments (LIDs) such as porous pavement, bioretention, planters, swales and runoff disconnects can reduce dry weather flows and thereby reduce the transport of pollutants to the receiving environment.

5.1.8 Fuel Modification

Fuel modification programs are proposed for specific areas of Buck Gully where the advance of invasive plant species and increased residential landscaping along the rims of canyons has led to increased fire risk. Fuel modifications would entail planting of native, drought-resistant species, removal of invasive species, the creation of fire beaks and specific building requirements to minimize risk to residences. Runoff reduction programs are also important in these communities to reduce the proliferation of invasive species.

5.1.9 Ordinances and Enforcement

Ordinances can be implemented to address a number of the challenges facing the watersheds. The City is implementing a runoff reduction program that includes specific ordinances in residential and commercial areas. In addition, smoking ordinances in areas with high fire risk can raise public awareness and reduce the risk of fire. Another proposed ordinance would be the

prohibition of the sale of invasive plant species. This ordinance would prevent the sale of invasive species at garden centers and promote the use of drought-resistant plant species. This would reduce fire risk, enhance water conservation and reduce erosion.

In addition enforcement can be directed towards key issues such as discharge control and hazardous waste disposal.

5.2 Subwatershed Prioritization

In order to focus resources on areas where greatest improvements could be made, a subwatershed prioritization process was undertaken. In this process, previously identified challenges facing each watershed were allocated a score reflecting identified ecological or stakeholder priorities. For instance, fire prevention was rated highest and was therefore allocated a maximum score of 100. As objectives and goals are further characterized or attained through the adaptive management plan defined by this WMP, the relative importance and priority ranking scores of each challenge may change. The overall goal of this priority process is to assess challenges in the (sub)watersheds with the most current data available in order to coordinate effective management and stakeholder collaboration activities to meet those challenges.

The key challenges facing the watershed were identified and given a score (Table 5-1).

Table 5-1: Challenge Identification and Scoring for Subwatershed Prioritization

Challenge	Score	Description
Fire Prevention:	100	In its catastrophic nature, fire is able to destroy both human and ecological habitat in a short period of time. Because of this, the urgency in which fire prevention measures should be implemented was deemed to be very high and was given a maximum score of 100.
Water Quality	25	This poses a challenge to the watershed and ASBS and has been given a medium priority score of 25
Canyon Stability and Erosion control	50	This poses an immediate challenge to the canyon areas and has therefore been given a high priority
ASBS Protection	25	ASBS protection has been given a medium priority because of the many different impacts, of which the watershed is just one
Habitat Restoration	5	Habitat restoration has been given a low priority because a longer term approach is required to improve habitat and more immediate challenges face the watershed.
Community Resources	10	This has a lower priority since a significant effort is already underway in terms of community resourcing
Water Conservation	25	This was given a medium priority because of the future water challenges Newport faces.

Each subwatershed was then scored on the basis of whether that challenge was present and to what degree (Table 5-2).

Table 5-2: Watershed Prioritization Process

Priority issues	Points	Buck Gully Canyon			Morning Canyon		Pelican Canyons	Los Trancos Canyon	Crystal Cove Canyon	Muddy Creek Canyon	El Morro Canyon
		Reach 1	Reach 2	Reach 3	Reach 1	Reach 2					
Fire Prevention	**100**	100	100		75	100	0	05	5	0	
Water Quality	**25**	25	25	25	25	25	25	25	5	25	15
Erosion Control	**50**	50	25	0	40	0	5	5	0	25	10
ASBS Protection	**25**	25	25	25	25	25	25	25	5	25	5
Habitat Restoration	**5**	5	5	5	5	5	5	5	0	5	3
Community Resources	**10**	10	10	10	0	0	10	10	0	0	5
Water Conservation	**25**	25	25	25	25	25	25	25	0	0	10
Total Score	**240**	**240**	**215**	**90**	**195**	**180**	**95**	**95**	**15**	**85**	**48**

This scoring process determined that Reaches 1 and 2 of Buck Gully and Morning Canyon were the highest priority subwatersheds, and are therefore the focus of current and near-term resources (Figure 5-3).

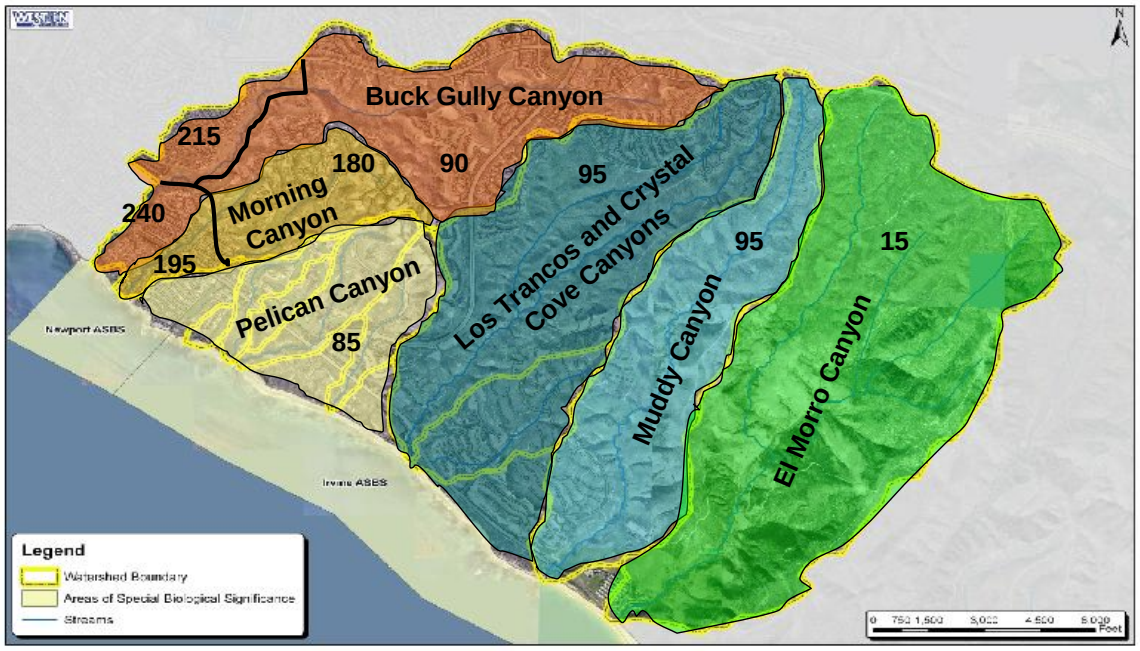

Figure 5-3: Watershed Prioritization with Individual Subwatershed Scores

5.3 Project Prioritization

Once subwatersheds were prioritized it was important to determine which projects would achieve maximum benefits in the most cost effective manner within those watersheds. The steps in this process are outlined below.

5.3.1 Project Cost Estimates

Individual projects costs were estimated based on:

1. **Permitting**: structural BMP projects were assumed to have an associated permitting component which was estimated based on current project understanding and permitting requirements.
2. **Capital expenditure**: costs were based on price-to-build today; inflation was not factored into the cost.
3. **Maintenance**: maintenance costs were estimated to be 10% of capital expenditure per annum for five years.
4. **FTE:** Full time equivalent employees required for project management: this cost was estimated on an annual salary of $50,000 with an estimate of the number of hours required to oversee and maintain the project over a five year period.

The overall costs were then added to give each project a cost estimate for implementation and maintenance over five years.

5.3.2 BMP Groupings

After cost analyses had been performed, projects were grouped into three tiers based on their complexity and achievable benefits:

Table 5-3: Best Management Practice Tiers

Tier	Example	Description
Tier 1:	Community outreach Docent training Ordinances Enforcement	Tier 1 BMPs focus on pollution prevention and source control measures that are designed to reduce the amount of pollutants entering runoff though education, enforcement and behavioral modification programs. These projects were also the most cost-effective projects (as determined in Step 1). Tier 1 projects might include outreach, education, ordinances, changes in policy, increased inspections and fines etc.
Tier 2	LIDs Street sweeping Irrigation controllers Native planting	Tier 2 BMPs include implementation of infiltration, bioretention and low-impact development (LID) techniques to further reduce pollutant entry into runoff. Additionally, Tier 2 includes source and design studies that will aid in the further identification of pollutant sources and provide design parameters for construction of effective in-line treatment systems as part of Tier 3. Key Tier 2 projects might include street sweeping, increased use in native plants, invasive plant removal, implementing SMART irrigation controllers for runoff reduction etc.
Tier 3	Stormwater diversions Erosion control	Tier 3 BMPs are infrastructure-intensive pollution reduction measures that typically require significant capital investment and/or have impacts on surrounding communities. An example of a complex Tier 3 project is the Buck Gully erosion control project.

5.3.3 BMP Prioritization

Projects were prioritized in terms of the number and magnitude of benefits they achieved. For instance, runoff reduction programs had significant beneficial outcomes in terms of water conservation and water quality improvements and some benefits to the ASBS. These benefits were weighted and projects were scored depending on the weighting. A cost benefit analysis was performed on each project to determine which project would achieve maximum benefit to the subwatershed.

6.0 WORK PLAN

Based on the process outlined in the previous section, projects were proposed for specific priority regions of the Newport Coastal Watershed. Those regions were categorized into:

- Buck Gully and Morning Canyon – as the highest priority subwatersheds
- Remaining Newport Coastal Watershed
- ASBS

In addition, some projects were proposed for the Newport Bay area to address potential impacts to the ASBS from potential cross contamination.

6.1 Buck Gully and Morning Canyon

This section presents those projects designed to address specific issues faced by the Buck Gully and Morning Canyon subwatersheds. These Canyons have the most significant development and the face the most challenges. The majority of projects are scheduled in the first five years of planning. Under the adaptive management strategy outlined, this timeframe would allow for effectiveness assessment and changes to the BMP implementation based on the success or otherwise of the individual project. A significant number of projects were identified for these two subwatersheds including many Tier 3 projects. These Tier 3 projects are required in the short term to address significant bank instability in the Buck Gully Canyon.

6.1.1 Buck Gully and Morning Canyon - Reach 1 Projects

The issues facing the lowest reach of the Buck Gully and Morning Canyon watersheds are diverse but are predominated by erosion. Buck Gully in this reach has significant bank instability and sediment issues which is further impacted by older residences and invasive plants. Together these issues have directed project focus towards sediment control, bank stabilization, runoff reduction and wetland restoration. Proposed projects are illustrated in Figure 6-1.

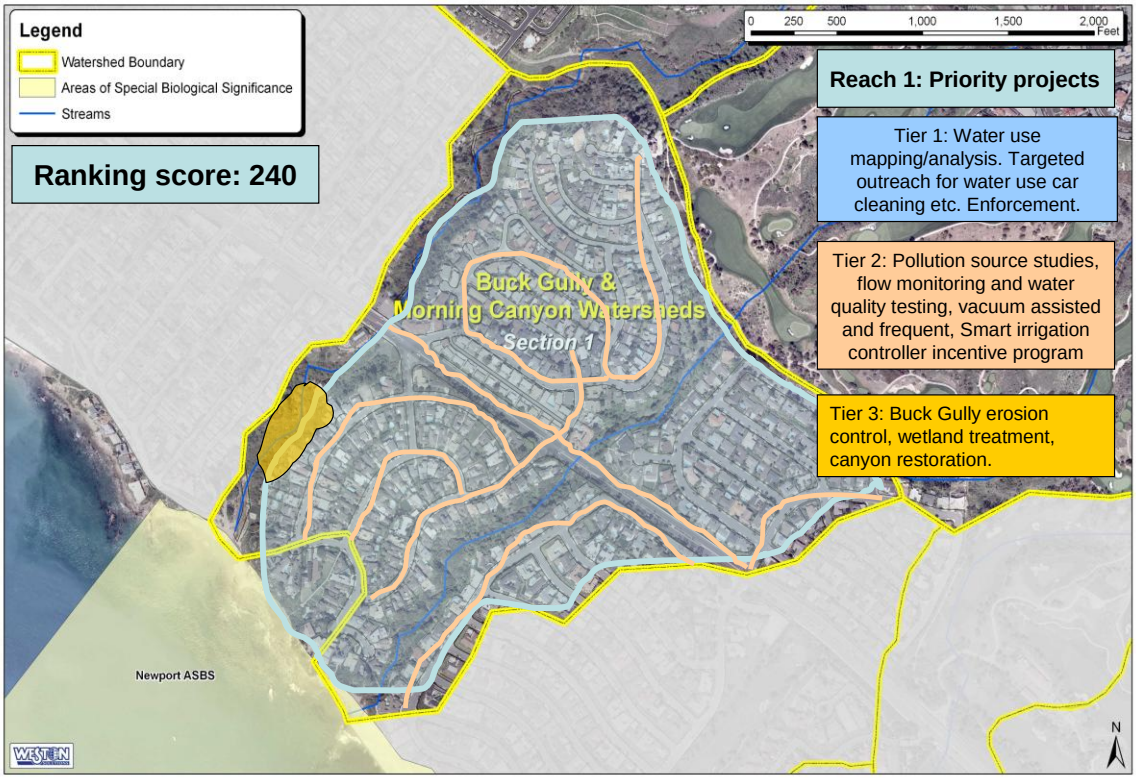

Figure 6-1: Projects Proposed for Buck Gully and Morning Canyon – Reach 1

Buck Gully Erosion Control Project

Design is currently being completed on an erosion control implementation project in Buck Gully. This project incorporates erosion control, grade control and wetland restoration to improve the water quality of Buck Gully. The most significant benefits of this work will be in sediment load reduction. Figure 6-2 illustrates the proposed project.

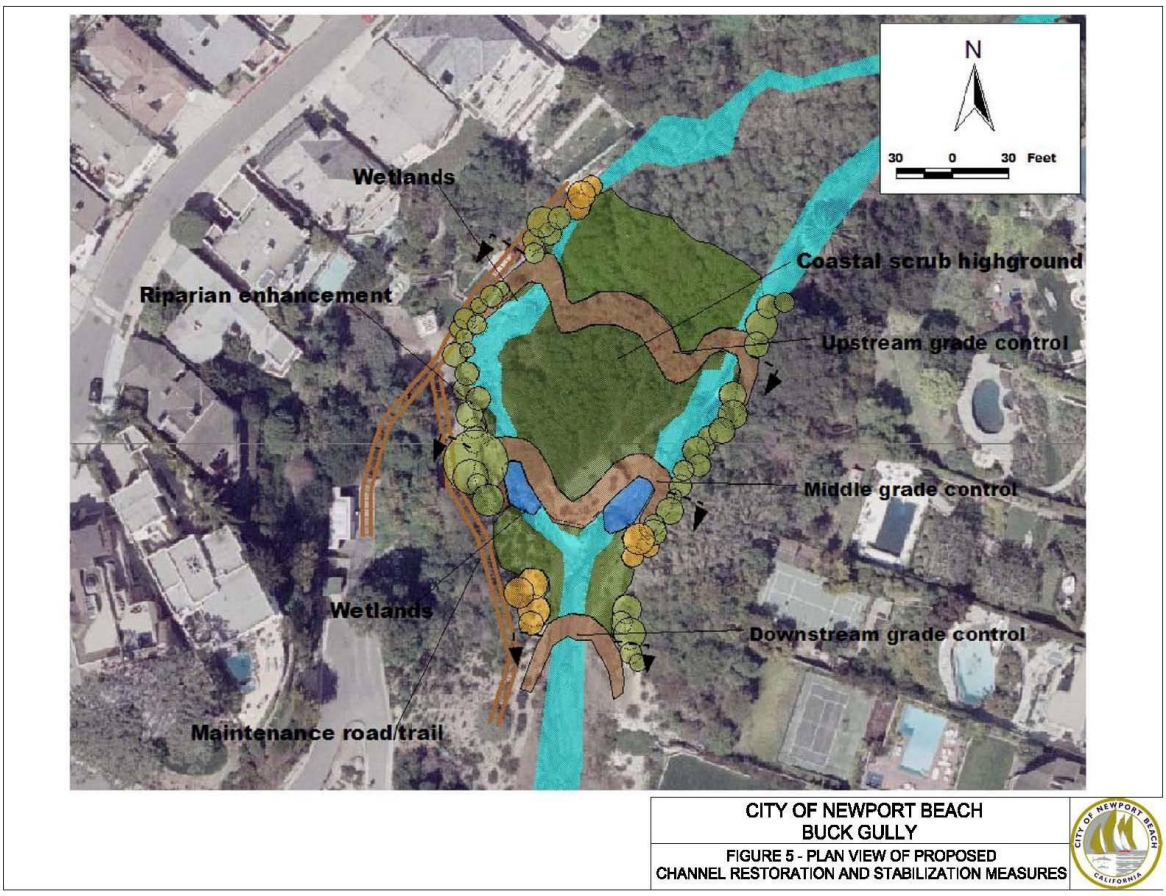

Figure 6-2: Proposed Buck Gully Erosion Control Project

The proposed schedule for these projects is presented in Figure 6-3.

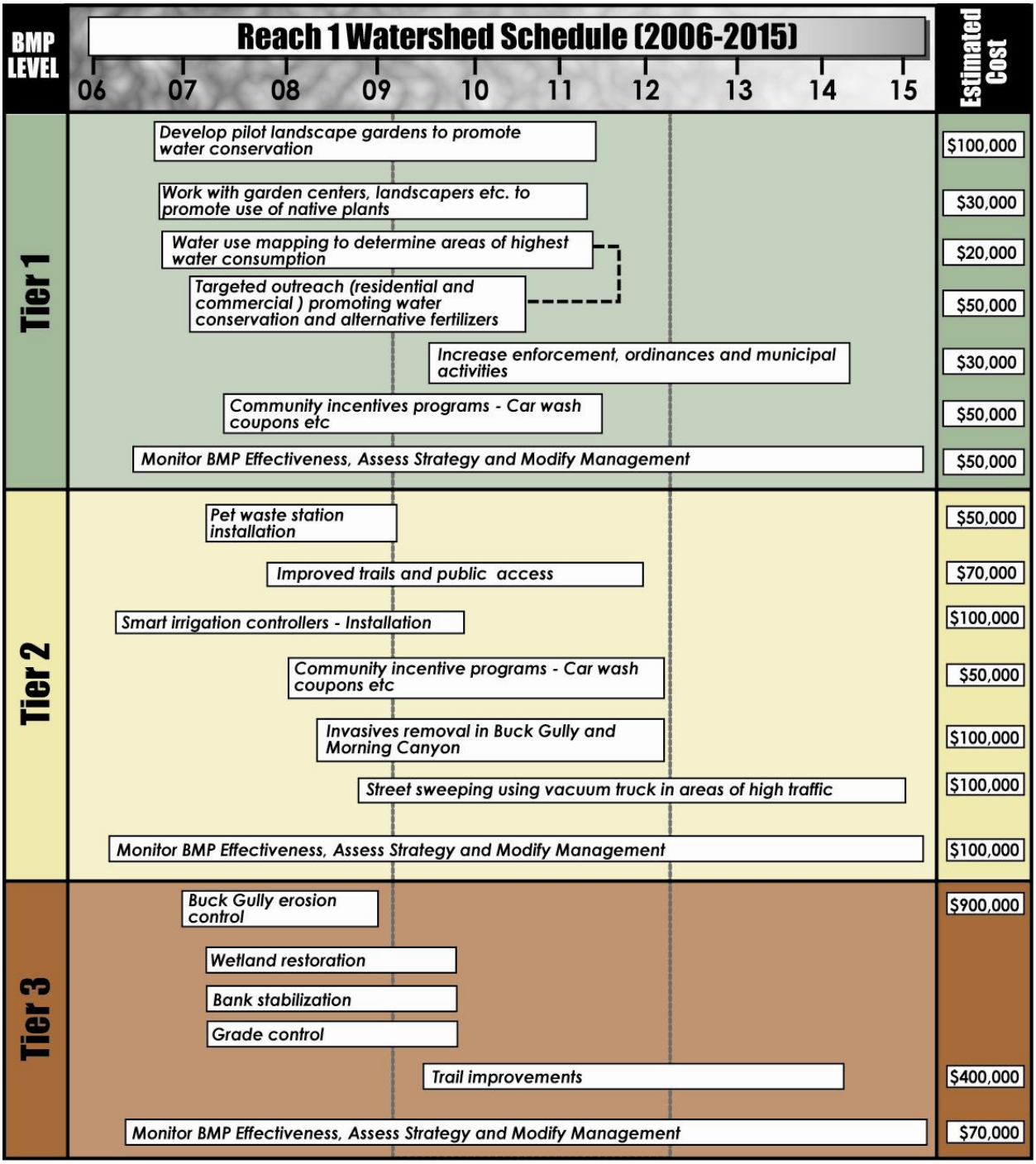

Figure 6-3: Proposed Buck Gully and Morning Canyon Reach 1 Project Schedule

6.1.2 Buck Gully and Morning Canyon - Reach 2 Projects

Reach 2 has significantly different challenges compared to the other reaches. It is the only residential area that has not undergone the fuel modification program to reduce the risk of fire. This program ensures that buffer setbacks are adequate and that invasive plants are controlled in order to reduce fuel presence. Projects for this area were prioritized to mitigate any fire risk as a

primary goal. The area also had significant runoff issues – mostly attributable to over-irrigation. Runoff reduction programs and installation of SMART controllers will be of particular importance in Reach 2. Additional key projects include the removal of invasive plants and improved public access.

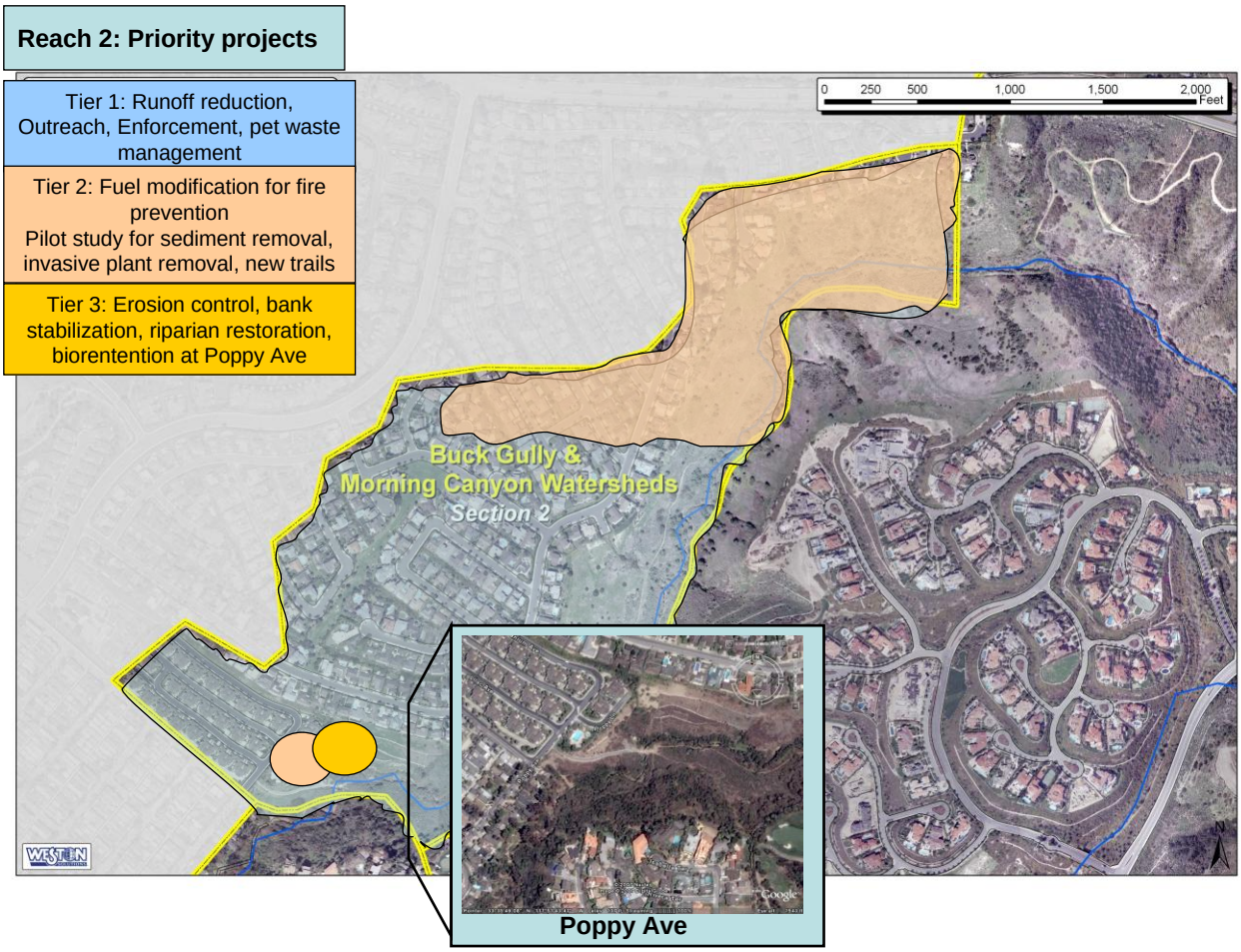

Figure 6-4: Projects Proposed for Buck Gully and Morning Canyon – Reach 2

Poppy Lane was identified as an area where a series of integrated projects could be implemented to showcase the "bundling" of projects for maximum benefit. This approach is illustrated in Figure 6-5.

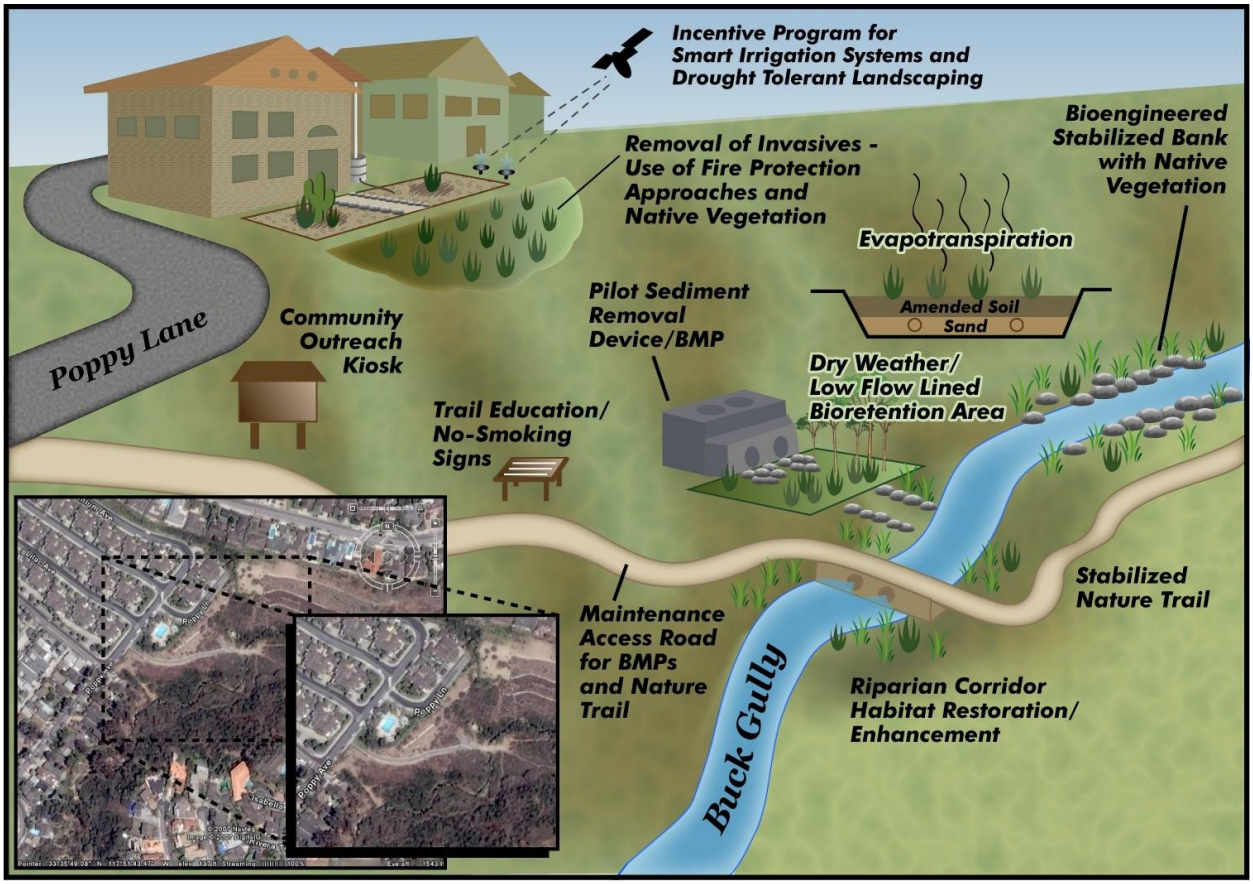

Figure 6-5: Proposed Project Integration for Poppy Lane

The approach proposed for Poppy Lane incorporates a number of different benefits:

- Public awareness will be improved through greater trail access, information kiosks, signage and pet waste stations
- Water quality will be improved through the installation of bioretention basins, pet waste stations and bank stabilization.
- Runoff reduction will be achieved through drought tolerant plantings and the installation of SMART controllers.

The proposed schedule for project implementation is presented in Figure 6-6.

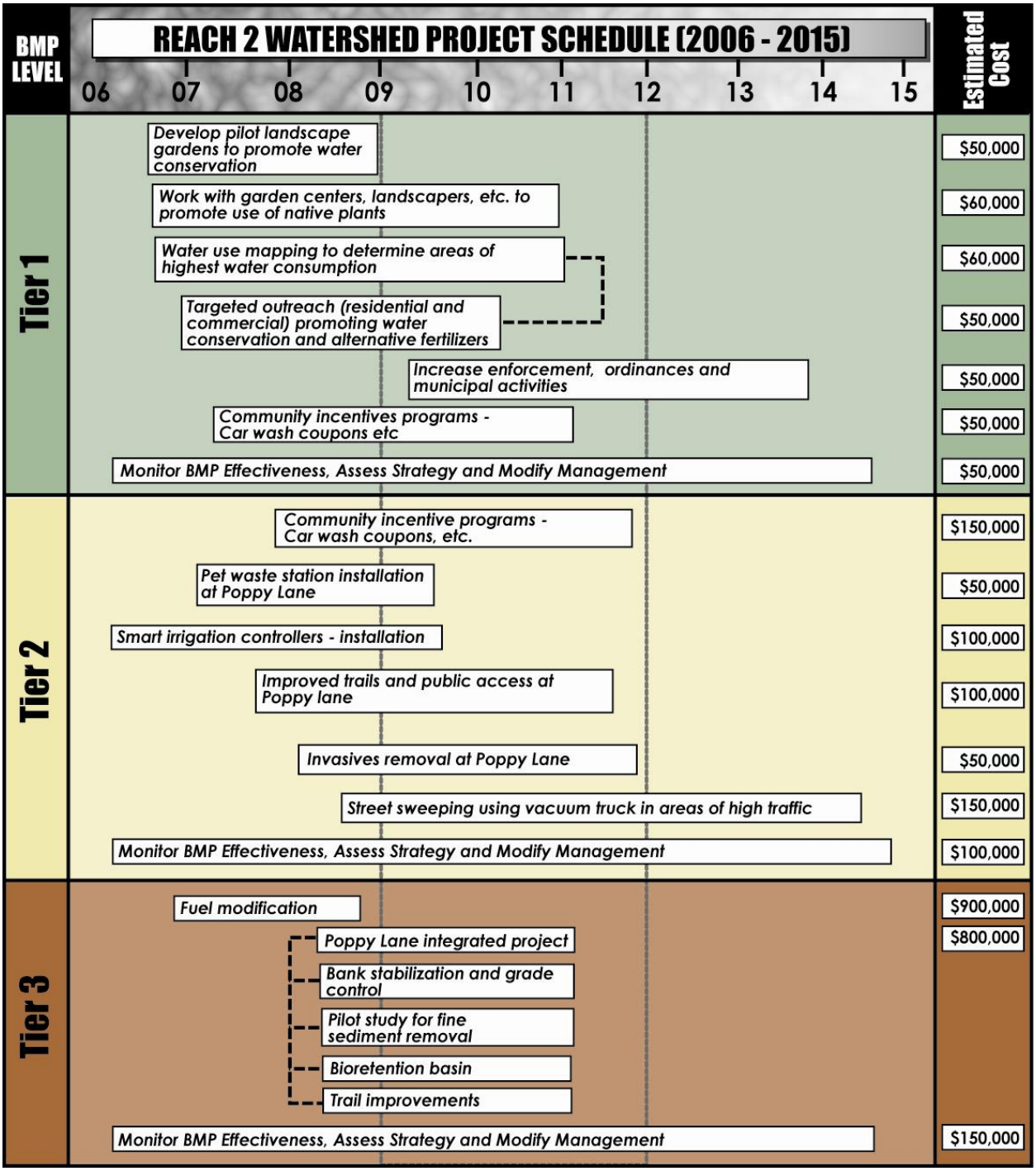

Figure 6-6: Proposed Buck Gully and Morning Canyon Reach 2 Project Schedule

6.1.3 Buck Gully and Morning Canyon - Reach 3 Projects

The key issues facing Reach 3 are:

- high water usage in a newer development;
- high water use and fertilizer runoff from the local golf course;

- invasive plants
- high usage roads

In order to mitigate these impacts a series of projects have been proposed (as illustrated in Figure 6-7) which include:

- aggressive street sweeping,
- targeted outreach to residents and golf courses (together with incentive programs to reduce over watering),
- improved trails
- invasives removal

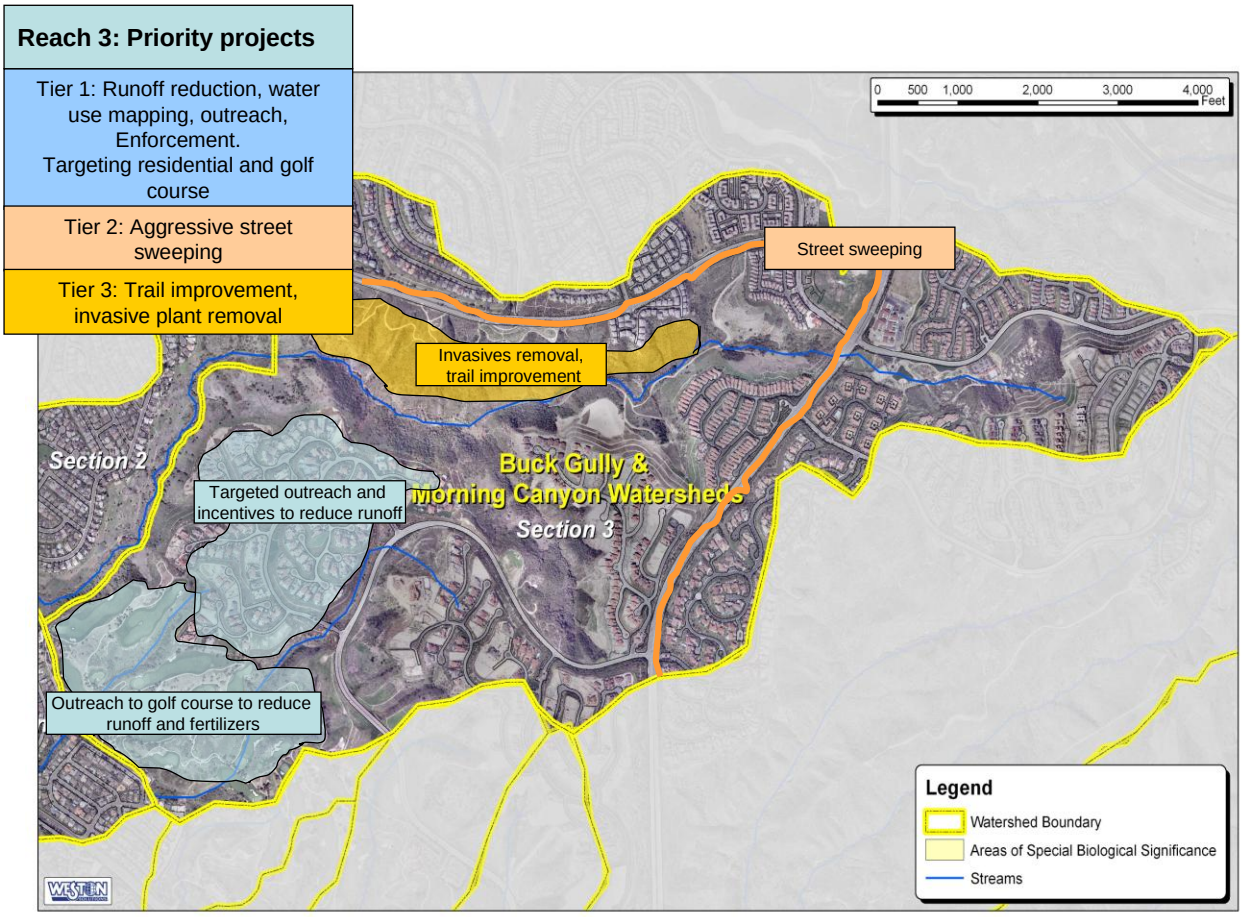

Figure 6-7: Projects Proposed for Buck Gully and Morning Canyon – Reach 3

The proposed schedule for projects in Reach 3 is presented in Figure 6-8.

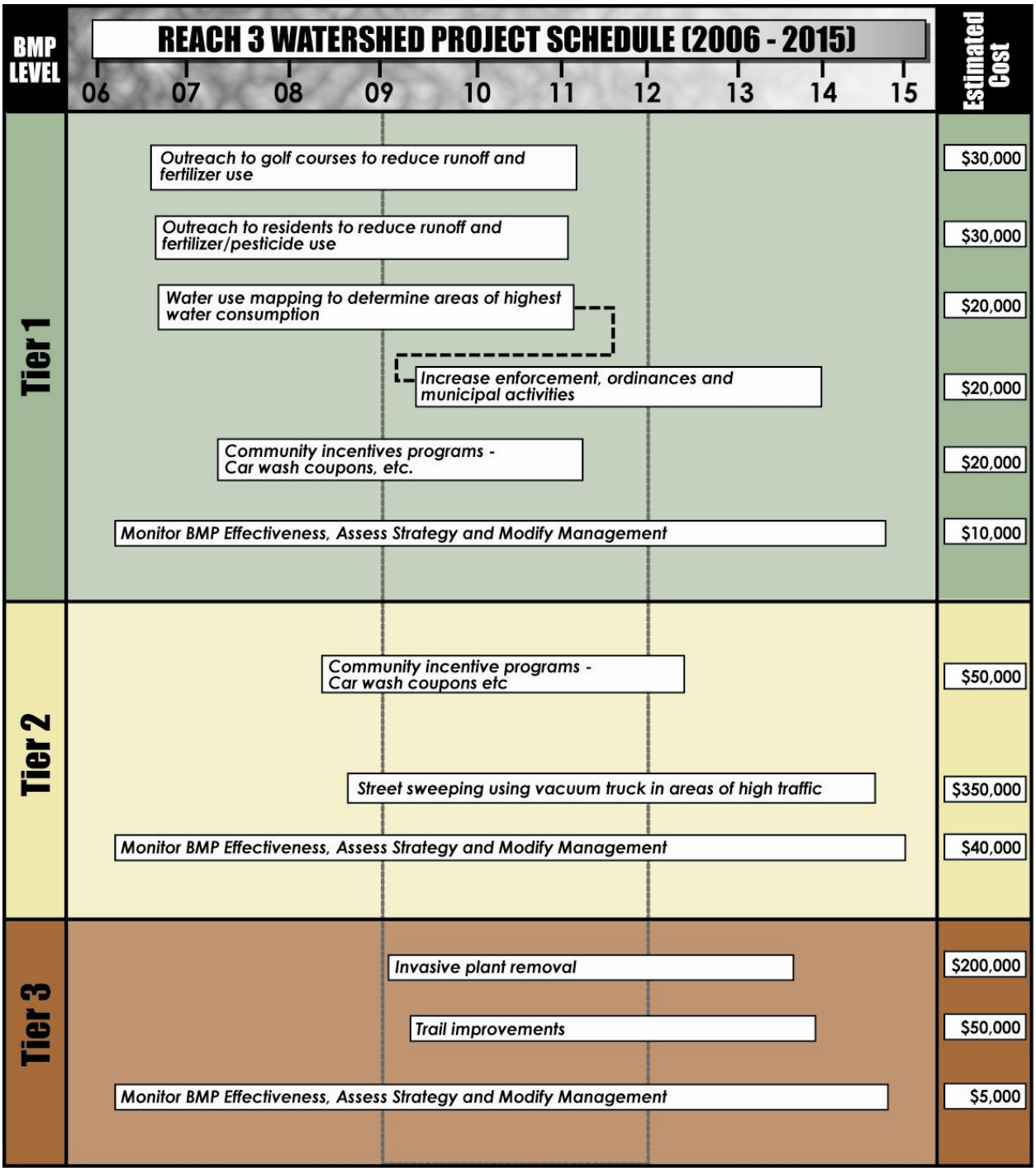

Figure 6-8: Proposed Buck Gully and Morning Canyon Reach 3 Project Schedule

6.2 Newport Coastal Watershed Projects

The Greater Newport Coastal Watershed has a lower priority compared to Buck Gully and Morning Canyon. However these canyon watersheds are characterized by erosion, water quality and water conservation issues. As such, a different series of projects have been identified which will mitigate many of the impacts from the Greater Newport Coastal Watershed. The key watershed issues include:

- High water usage and dry weather runoff
- Erosion and bank instability
- Public access
- Invasive plants

The emphases of projects in this bundle are to:

1. Remove non-native plants thereby reducing fire hazard and improving public access.
2. Reduce dry weather flows through the implementation of smart irrigation controllers. This would also lead to improvements in water quality and reduce the chances of erosion and sediment entry in to the ASBS.
3. Improve public awareness and understanding regarding water conservation, water quality protection, ASBS protection, fire prevention strategies
4. Provide the public with incentives for behavior change
5. Reduce the transport of pollutants with street sweeping and the implementation of LIDs.

The proposed project schedule for the Newport Coast watershed is presented in Figure 6-9.

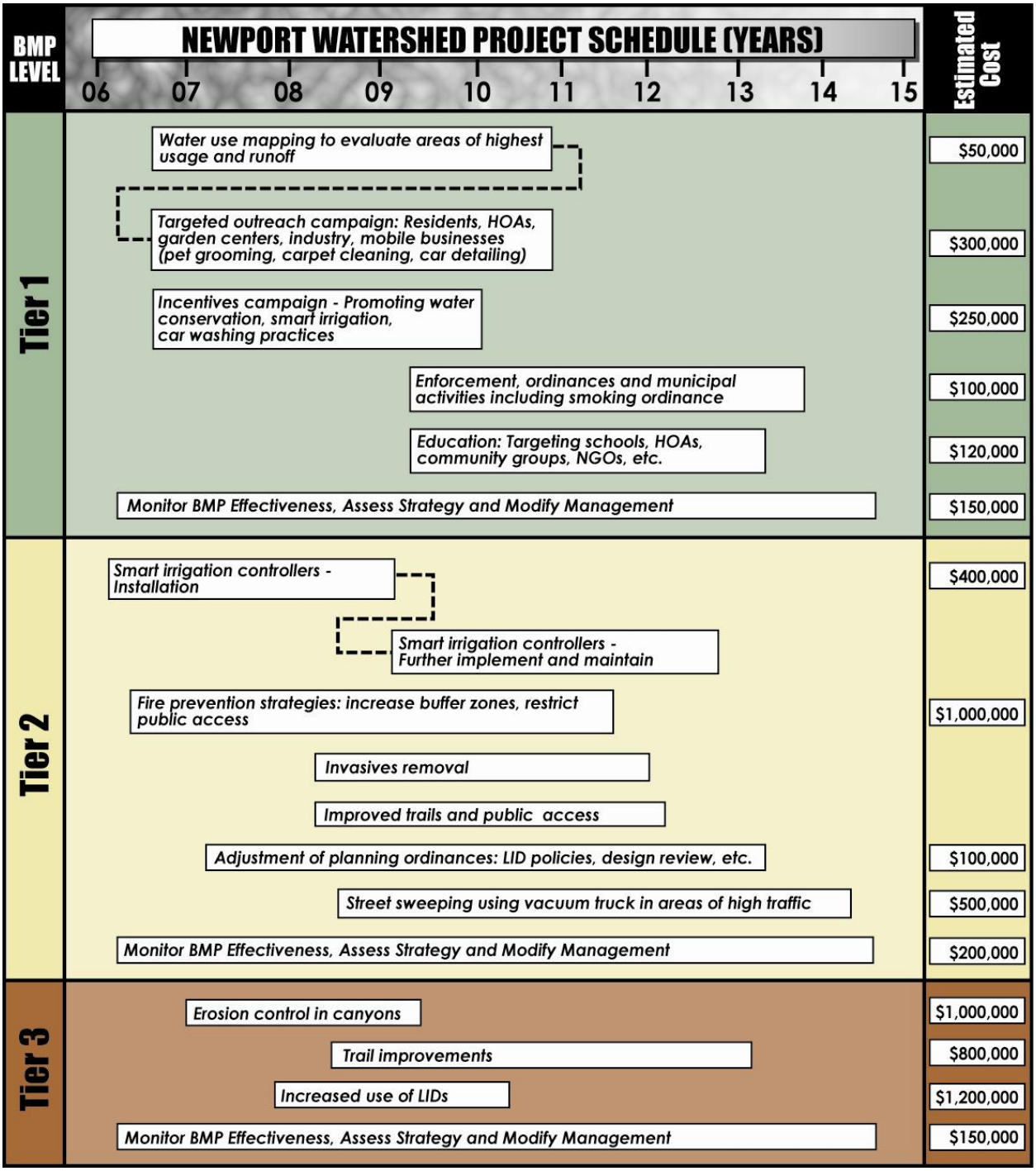

Figure 6-9: Proposed Newport Coast Project Schedule

6.3 ASBS Specific Projects

The ASBS has many specific attributes which lends itself to a specific set of scheduled projects. The ASBS is impacted by many different sources, the watershed being only one of those sources. A number of specific projects have been identified to characterize these multiple sources, understand the impacts and mitigate the effects. Many of the proposed projects are special studies bundled with implementation projects. This bundling ensures that the ASBS is better characterized and managed.

These specific projects include:

- Runoff reduction program
- Canyon and Creek Bank erosion control
- Restoration of ASBS
- Reduction of Public Impact
- Implementation of LID projects
- Copper elimination program
- Nutrient load and cross contamination
- Habitat restoration and fire prevention
- Diversion at Pelican Point

It should be noted that some of these projects overlap with those described in the Reaches 1 and 2 because they have a direct beneficial effect on the ASBS.

6.3.1 Runoff Reduction Program

This program includes:

- Incentive Program for Residential Irrigation Controllers
- California Friendly Landscape Incentive Program – Taylor Nurseries Program – Outreach Functions
- Revisions to City Codes – Over-irrigation Controls
- Enforcement of City Codes
- Effectiveness Assessment Monitoring of Flow Reductions in Coordination with IRWD
- ASBS Impact Metric Assessment – Monitoring of ASBS to assess improvement of biomarker species from lower dry weather fresh water flows
- Development of data information tools to track effectiveness of runoff reduction program
- Development of outreach tools and web-based information on runoff reduction program

The benefits to the ASBS are:

- Reduction of Dry Weather Impacts to Rocky Tidal Area – Improve Habitat through reduction of fresh water exposure
- Reduction of Metal Loading to ASBS from Dry Weather Flows
- Reduction of Bacteria Load to ASBS
- Assessment using ASBS Impact Metric

6.3.2 Canyon and Creek Bank Erosion Control

This program includes:

- Stream Channel Grade Controls to Reduce Velocity
- Erosion Control and Bank Stabilization
- Riparian Corridor Restoration through Invasive Species Removal and Establishment of Natives
- Construction of Natural Treatment System to Filter Water and Restore Habitat
- Establishment of Hiking Trails at Poppy Lane and Public Education Signage and Kiosk on Water Quality
- Effectiveness Assessment of NTS and Erosion Controls on Reduction of Sediment and other Pollutant Loads
- ASBS Impact Metric Assessment – Reduction of Sediment
- Develop outreach tools and web-based information on behaviors that contribute to sediment loading
- Employ a habitat manager responsible for implanting restoration programs

The benefits to the ASBS are:

- Reduction of sediment load to ASBS by erosion Controls
- Reduction of metals and nutrients loads to ASBS through NTS filtering

6.3.3 Restoration of ASBS

This program includes:

- Removal of invasive brown algae in rocky inter-tidal to enhance re-establishment of native algae
- Eelgrass restoration
- Assessment of success of ongoing restoration activities and invasive removal program
- ASBS Impact Metric Assessment of potential impact to sub-tidal area to further assess effectiveness of restoration and ASBS, watershed and bay impact reduction projects
- Development of information management tools for ASBS restoration

The benefits to the ASBS are:

- Continues restoration efforts in rocky inter-tidal
- Effectiveness Assessment using Impact Metric for ASBS
- Expansion of Assessment to sub-tidal portion of ASBS to provide complete assessment

6.3.4 Reduction of Public Impact

This program includes:

- Develop and Implement pilot exclusion zone modeled from State Park programs to re-establish Vegetation along Trails
- Expansion of docent program to further limit public impact on ASBS
- Evaluate policy for potential of establishing rotating public exclusion zones in ASBS
- Develop management plan for ASBS public assess

- Implement cooperation program with education groups/institute to limit public impact using touch tanks, rotation of study areas and docent coordination
- Effectiveness assessment of public use reduction program
- Development and implementation of information management tools for public impact assessment
- Development and implementation of web-based educational tools on public impact to ASBS linked to City web-site and local/regional educational institutions

The benefits to the ASBS are:

- Reduction of public use impact to ASBS
- Assessment of public use impact reduction

6.3.5 Implementation of LID Projects

This program includes:

- Implementation of a LID projects to reduce dry weather and low wet weather flows
- BMP which first removes gross solids and then separate the coarse and fine fraction sediments that will allow coarse fraction sediments to pass to creek under higher flows
- Bio-retention unit which further reduces low flows and reduce metals and bacteria loading to the creek and ASBS
- Pollutant source tracking in the watershed and at the ASBS shoreline to identify and verify sources highest loading of bacteria to the creek and ASBS
- Effectiveness assessment monitoring of the BMP including assessment of the potential of re-growth in the creek after the BMP discharge.
- Information Management of BMP Effectiveness Assessment
- Public outreach and education information and trail enhancement near pilot BMP
- Development of outreach tools and web-based information on behaviors that contribute to bacteria and metals loading

The benefits to the ASBS are:

- Reduction of sediment, metals and bacteria loading to the ASBS (all pollutants of concern)
- Assessment of effectiveness of this type of BMP to reduce impacts to ASBS
- Identify highest sources of pollutant loading to ASBS to further prioritize BMPs

6.3.6 Copper Reduction Program

This program includes:

- Implement boat paint management program to reduce presence of toxic paints in the ASBS
- Conduct biological production modeling of Eelgrass beds in Newport Bay to assess uptake of metals and possible transport to ASBS
- Conduct study of potential source of bacteria from Eelgrass deposited along shoreline
- Study shading effects on Eelgrass production in Newport Bay

The benefits to the ASBS are:

- Eelgrass may uptake certain metals and then be transported to ASBS that could impact ecosystem
- Eelgrass that is washed along shoreline may be source of bacteria or media for regrowth
- Implementing a paint management program would reduce the presence of metals in the marine environment.

6.3.7 Nutrient Load and Cross Contamination

This program includes:

- Assess cause of algae blooms and correlation to high nutrients load into the Bay
- Conduct Cross Contamination Model to evaluate migration of nutrient to ASBS
- Jetty modification study
- Fertilizer management program

The benefits to the ASBS are:

- Algae Blooms and Increased Nutrient Load may impact ASBS
- Managing fertilizer runoff will reduce presence in the ASBS

6.3.8 Habitat Restoration and Fire Prevention

This program includes:

- Fuel modification program in Reach 2 of Buck Gully and Morning Canyon
- Residential incentive program for using drought-resistant native plants
- Pilot landscaping project to encourage use of native plants
- Outreach to garden centers to encourage use of native plantings
- Removal of invasive plants
- Use of drought tolerant plants
- Restoration of native coastal scrub habitat
- Pilot landscaping projects

The benefits to the ASBS are:

- Upstream habitat protection.
- Improvement in canyon and downstream water quality

6.3.9 Dry Weather Diversion at Pelican Point

This program includes:

- Construction of a diversion at Pelican Point to reduce storm drain runoff in the marine environment

The benefits to the ASBS are:

- Reduces contaminant loads, associated with stormwater, entering the ASBS
- Protects against sanitary sewer overflows

The proposed schedule for ASBS projects is presented in Figure 6-10.

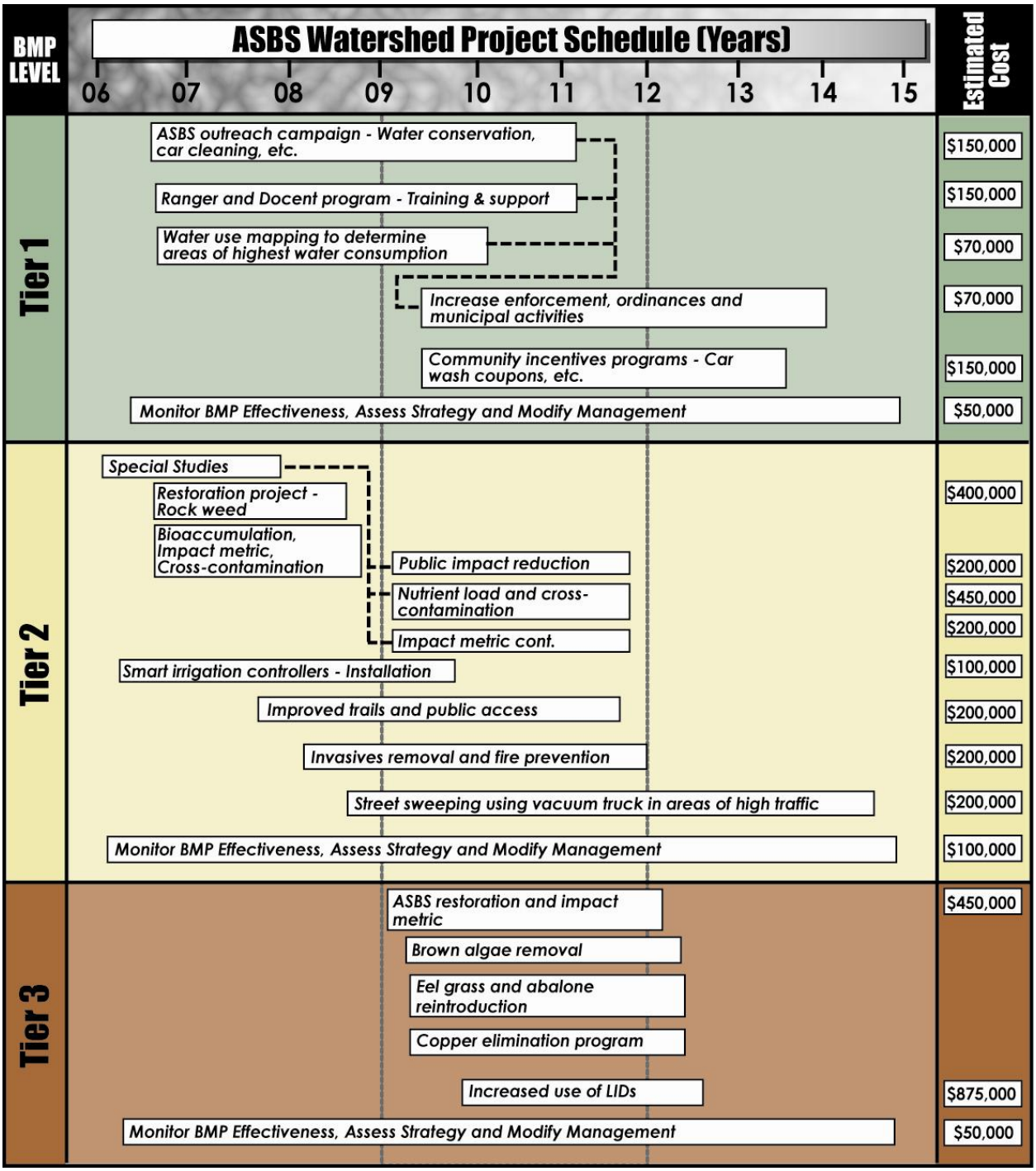

Figure 6-10: Proposed ASBS Project Schedule

6.4 Newport Bay Projects

The impact of Newport Bay on the ASBS is currently being investigated. Initial results suggest that Newport Bay has some significant impact on the adjacent waterways and as such as series of longer term projects have been developed to address some of those impacts.

Those issues include:

- Pollutants from the large boating community (such as toxic paints and antifoulants)
- Runoff from the City of Newport
- Metals and PAHs from transportation sources
- Near shore habitat deterioration

In order to address these concerns it is necessary to schedule projects that will improve water quality to the ASBS from these sources. The proposed schedule for these projects is presented in Figure 6-11.

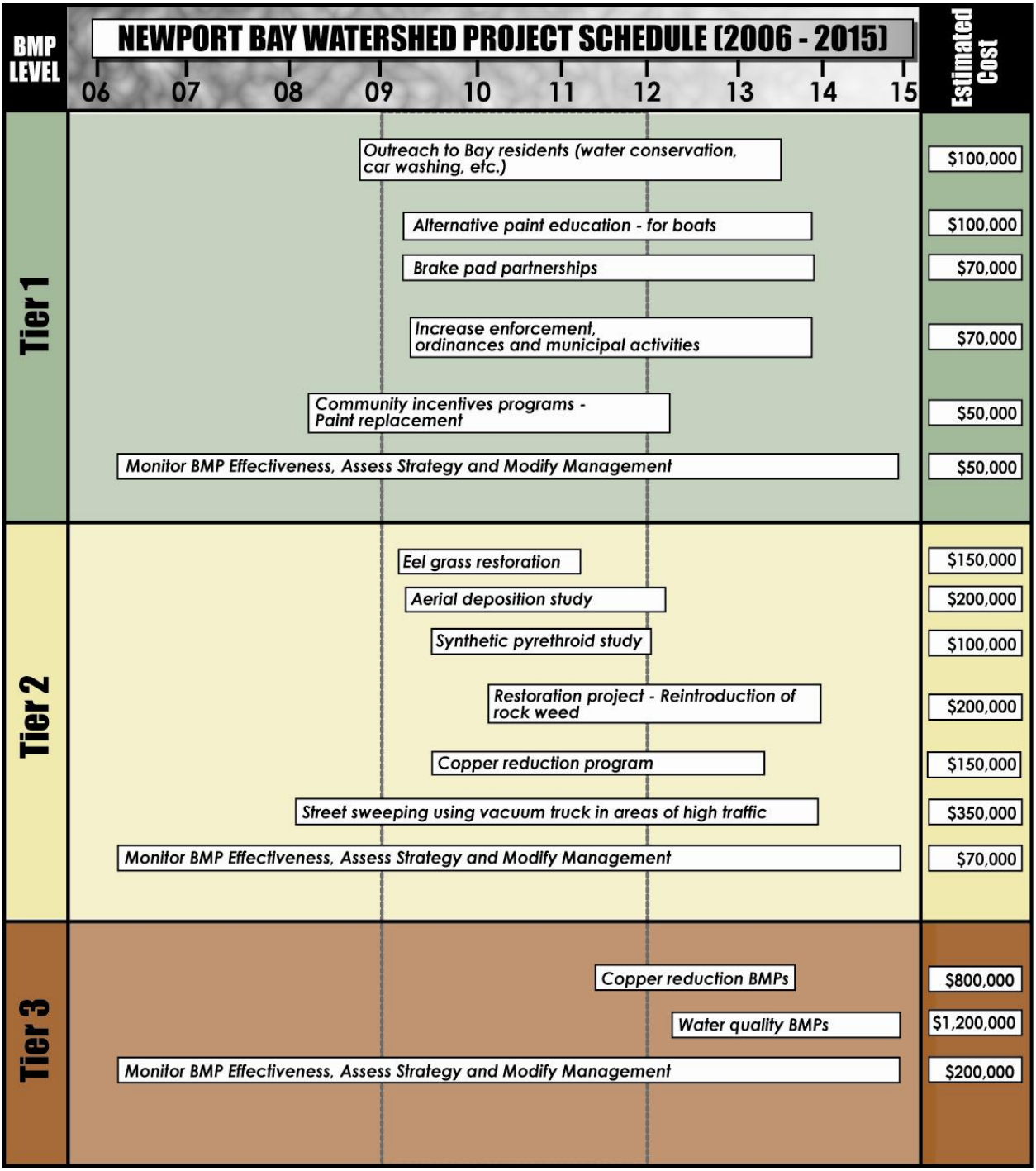

Figure 6-11: Proposed Schedule for Newport Bay Projects

7.0 REGIONAL OBJECTIVES

Planning is currently underway to incorporate the Newport Coast WMP into a larger undertaking for the Newport Bay WMP. As the ASBS areas of Newport Coast are the receiving waters for the Newport Bay Watershed, it is critical that the two areas be covered under a single management planning effort. The Newport Bay WMP will also include aspects of the Newport Coast WMP as well as the results of the on-going Harbor Area Management Plan and the Laguna Beach WMP.

This section presents the regional objectives of the different plans as well as potential conflicts in merging those objectives.

7.1 Newport Coast Watershed Management Plan

Table 7-1 identifies key benefits from each of the proposed projects in terms of the benefits described in the Integrated Regional Watershed Management Plan (IRWMP).

Table 7-1: Summary of project benefits according to IRWMP objectives

Project Name	Water Supply	Groundwater Management	Aquatic Ecosystems and Watershed Management	Water Conservation	Water Quality	Sewage and Flood Management	Information Management
Buck Gully and Morning Canyon – Reach 1	○	●	●	●	●	●	●
Buck Gully and Morning Canyon – Reach 2	○	●	●	●	●		●
Buck Gully and Morning Canyon – Reach 3 (Section **6.1.3**)	○		●	●	●		●
General Newport Watershed projects (Section **6.2**)	○	○	●	●	●	●	○
ASBS specific projects (Section **6.3**)			●	●	●		
Newport Bay Projects	○	○	●	●	●		○

● direct benefit
○ indirect benefit

Table 7-2 provides the initial scoping of project bundles submitted under the Orange County IRWMP. These projects are the preliminary prioritized groupings focusing on maximized benefits to the ASBS. The IRWMP and ICWMP benefits are identified and assigned a score. Those projects with a high or medium score have been designated as Phase 1 projects.

Table 7-2: Project Integration with Newport Bay and Newport Coast WMP Objectives

Project Title	Description of Components	WMP PHASE (Location)	Linkage to ASBS Protection	Newport Bay WMP objectives							Newport Bay Score	Newport Coast WMP objectives							Newport Coast Score	Total Score	Estimated cost (Source)
				Water Supply	Ground Water Management	Aquatic Ecosystem and Watershed Management	Water Conservation	Water Quality	Sewage and Flood Management	Information Management		Fire Prevention	Improving Water Quality	Addressing Canyon Mod., Erosion, and Sediment Control	Protecting ASBS	Managing Habitat and Biological Resources	Water Conservation	Enhancing Community Resources			
1. Runoff Reduction Program	• Incentive Program for Residential ET Controllers • California Friendly Landscape Incentive Program – Taylor Nurseries Program – Outreach Functions • Revisions to City Codes – Over-irrigation Controls • Enforcement of Codes • Effectiveness Assessment Monitoring of Flow Reductions in Coordination with IRWD • ASBS Impact Metric Assessment – Monitoring of ASBS to assess improvement of biomarker species from lower dry weather fresh water flows • Develop data information tools to track effectiveness of runoff reduction program • Develop outreach tools and web-based information on runoff reduction program	Phase 1 (Newport – wide)	Reduction of Dry Weather Impacts to Rocky Tidal Area – Improve Habitat through reduction of fresh water exposure Reduction of Metal Loading to ASBS from Dry Weather Flows Reduction of Bacteria Load to ASBS Assessment using ASBS Impact Metric	•	•	•	•	•	•	•	High		•	•	•		•		High	High	$575,000
2. Canyon and Creek Bank Erosion Control BMPs and Riparian and Freshwater Wetland Restoration Project	• Stream Channel Grade Controls to Reduce Velocity • Erosion Control and Bank Stabilization • Riparian Corridor Restoration through Invasive Species Removal and Establishment of Natives • Construction of Natural Treatment System to Filter Water and Restore Habitat • Establishment of Hiking Trails at Poppy Lane and Public Education Signage and Kiosk on Water Quality • Effectiveness Assessment of NTS and Erosion Controls on Reduction of Sediment and other Pollutant Loads • ASBS Impact Metric Assessment – Reduction of Sediment • Develop outreach tools and web-based information on behaviors that contribute to sediment loading • Employ a habitat manager responsible for implanting restoration programs	Phase 1 (Reach 1 and Reach 2)	Reduction of Sediment load to ASBS by Erosion Controls Reduction of metals and nutrients loads to ASBS through NTS filtering			•	○	•	•	•	High		•	•	•	•		•	High	High	1,500,000

Project Title	Description of Components	WMP PHASE (Location)	Linkage to ASBS Protection	Newport Bay WMP objectives							Newport Bay Score	Newport Coast WMP objectives							Newport Coast Score	Total Score	Estimated cost (Source)
				Water Supply	Ground Water Management	Aquatic Ecosystem and Watershed Management	Water Conservation	Water Quality	Sewage and Flood Management	Information Management		Fire Prevention	Improving Water Quality	Addressing Canyon Mod., Erosion, and Sediment Control	Protecting ASBS	Managing Habitat and Biological Resources	Water Conservation	Enhancing Community Resources			
3. Restoration of ASBS and Ecosystem Impact Metric	• Removal of Invasive Brown Algae in Rocky Inter-tidal to enhance re-establishment of native algae • Eelgrass restoration • Assessment of Success of ongoing restoration activities and invasive removal program • ASBS Impact Metric Assessment of Potential Impact to Sub-tidal Area to Further Assess Effectiveness of Restoration and ASBS, Watershed and Bay Impact Reduction Projects • Development of Information Management Tools for ASBS Restoration	Phase 1 (ASBS)	Continues restoration efforts in rocky inter-tidal Effectiveness Assessment using Impact Metric for ASBS Expansion of Assessment to Sub-tidal portion of ASBS to provide complete assessment			•		•		•	Medium		•		•	•		•	Medium	medium	$200,000
4. Implementation of Reduction of Public Impact to ASBS Program	• Develop and Implement Pilot Exclusion Zone Modeled from State Park Programs to Re-establish Vegetation along Trails • Expansion of Docent Program to further limit public impact on ASBS • Evaluate Policy for Potential of Establishing Rotating Public Exclusion Zones in ASBS • Develop Management Plan for ASBS Public Assess • Implement Cooperation Program with Education Groups/Institute to Limit Public Impact using touch tanks, rotation of study areas and docent coordination • Effectiveness Assessment of Public Use Reduction Program • Development and Implementation of Information Management tools for Public Impact Assessment • Development and implementation of web-based educational tools on public impact to ASBS linked to City web-site and local/regional educational institutions	Phase 2 (ASBS)	Reduction of Public Use Impact to ASBS Assessment of Public Use impact reduction			•				•	Low				•	•		•	Low	Low	$200,000 total

Project Title	Description of Components	WMP PHASE (Location)	Linkage to ASBS Protection	Newport Bay WMP objectives							Newport Bay Score	Newport Coast WMP objectives							Newport Coast Score	Total Score	Estimated cost (Source)
				Water Supply	Ground Water Management	Aquatic Ecosystem and Watershed Management	Water Conservation	Water Quality	Sewage and Flood Management	Information Management		Fire Prevention	Improving Water Quality	Addressing Canyon Mod., Erosion, and Sediment Control	Protecting ASBS	Managing Habitat and Biological Resources	Water Conservation	Enhancing Community Resources			
5. Implementation of regionally relevant Low Impact Design BMP projects: Reducing Sediment, Metals and Bacteria Load – Treatment Train with Solids Removal, Fine Sediment Removal and Bio-retention	• Implementation of a Pilot BMP for Dry weather and low wet weather flows that will consist of a treatment train approach • BMP will first remove gross solids and then separate the coarse and fine fraction sediments that will allow coarse fraction sediments to pass to creek under higher flows • Bio-retention unit will further reduce low flows and reduce metals and bacteria loading to the creek and ASBS • Pollutant Source Tracking in the Watershed and at the ASBS shoreline to identify and verify sources highest loading of bacteria to the creek and ASBS • Effectiveness Assessment Monitoring of the BMP including assessment of the potential of re-growth in the creek after the BMP discharge. • Information Management of BMP Effectiveness Assessment • Public Outreach and Education Information and Trail Enhancement near pilot BMP • Develop outreach tools and web-based information on behaviors that contribute to bacteria and metals loading	Phase 1 (Poppy Lane - Reach 2) Project has regional relevance in that successful designs can be further implemented in other locations affected by bacteria, metals and sediment	Reduction of Sediment, Metals and Bacteria Loading to the ASBS (all pollutants of concern) Assessment of effectiveness of this type of BMP to reduce impacts to ASBS Identify highest sources of pollutant loading to ASBS to further prioritize BMPs	○	○	●	●	●	○	●	High	○	●	●	●	●	●	●	High	High	$875,000
6. Copper elimination program	• Implement boat paint management program to reduce presence of toxic paints in the ASBS • Conduct Biological Production Modeling of Eelgrass beds in Newport Bay to assess uptake of metals and possible transport to ASBS • Conduct Study of Potential Source of Bacteria from Eelgrass deposited along shoreline • Study shading effects on Eelgrass production in Bay	Phase 2 (ASBS)	Eelgrass may uptake certain metals and then be transported to ASBS that could impact ecosystem Eelgrass that is washed along shoreline may be source of bacteria or media for regrowth Implementing a paint management program would reduce the presence of metals in the marine environment.			●		●		●	Medium		●		●	●			Medium	Medium	$150,000

Project Title	Description of Components	WMP PHASE (Location)	Linkage to ASBS Protection	Newport Bay WMP objectives							Newport Bay Score	Newport Coast WMP objectives							Newport Coast Score	Total Score	Estimated cost (Source)
				Water Supply	Ground Water Management	Aquatic Ecosystem and Watershed Management	Water Conservation	Water Quality	Sewage and Flood Management	Information Management		Fire Prevention	Improving Water Quality	Addressing Canyon Mod., Erosion, and Sediment Control	Protecting ASBS	Managing Habitat and Biological Resources	Water Conservation	Enhancing Community Resources			
7. Study of Nutrient Load in Bay and Algae Blooms – Cross Contamination Study to ASBS	• Fertilizer management program • Assess cause of algae blooms and correlation to high nutrients load into the Bay • Conduct Cross Contamination Model to evaluate migration of nutrient to ASBS	Phase 2 (ASBS)	Algae Blooms and Increased Nutrient Load may impact ASBS Managing fertilizer runoff will reduce presence in the ASBS			●		●		●	Medium				●	●			Low	Low	$450,000
8. Fire prevention	• Fuel modification program in Reach 2 • Residential incentive program for using drought-resistant native plants • Pilot landscaping project to encourage use of native plants • Outreach to garden centers to encourage use of native plantings • Removal of invasive plants • Use of drought tolerant plants • Restoration of native coastal scrub habitat • Pilot landscaping projects	Phase 1 (Reach 2)	Upstream habitat protection. Improvement in canyon and downstream water quality			●					Low	●							Low	Low	$400,000
9. Diversion at Pelican Pt	• Construction of a diversion at Pelican Point to reduce storm drain runoff in the marine environment	Phase 1 (Pelican Point)	Reduces contaminant loads entering the ASBS		○		○	●	●		Low		●	●					Low	Low	$400,000

● direct benefit
○ indirect benefit

7.2 Laguna Beach and the Integrated Coastal Watershed Management Plan

The City of Laguna Beach has jurisdictional authority of the canyons directly south of El Morro. The Emerald, Goat and Laguna Canyons discharge into the Heisler Park ASBS. The City of Laguna Beach is working cooperatively with the City of Newport to develop a WMP for its coastal area. Under this integrated plan the goals and objectives of Laguna Beach are aligned with those of the City of Newport to develop interrelated projects which benefit the ASBS. This section presents a preliminary assessment of the Laguna projects and their alignment with the Integrated Regional WMP objectives. Further project alignment is scheduled to occur in 2007.

The City of Laguna Beach has identified the following goals in their project prioritization:

- Improving and maintaining water quality
- Preserving the beneficial uses of water contact recreation, shellfish harvesting
- Decreasing the presence of bacteria in recreational waters

Table 7-1 identifies key benefits from each of the proposed projects in terms of the benefits described in the IRCWMS.

Heisler Park

The most significant works proposed for ASBS protection is the Heisler Park renovations. The Heisler Park ASBS Protection and Preservation Project represents the final phase of the 50-year master plan to renovate Heisler Park in Laguna Beach. The park renovation is implemented in two phases. The first phase, funded through a consolidated grant with the County of Orange, is underway. The final phase, described herein, completes the renovation. The primary goal of the project is to reduce bacteria loads to the adjacent ASBS and beaches. The goal will be achieved by minimizing bacteria-carrying runoff from the park and reducing sewer spill risks by reconstructing park restrooms and a lift station. The project design, funded in part by the Coastal Conservancy, is complete. Necessary permits and matching funds are in place for implementation. Heisler Park is a premier destination for tourists and a key natural resource for California. Completion of this final phase of the renovation is crucial to enhancing and preserving water quality in the ASBS and local beaches.

Table 7-3: Summary of Laguna Project Benefits According to IRCWMS Objectives

Project Name	Water Supply	Groundwater Management	Aquatic Ecosystems and Watershed Management	Water Conservation	Water Quality	Sewage and Flood Management	Information Management	Estimated Cost
Heisler Park Preservation and Restoration			●		●	●		$6,200,000
Interpretive center at Heisler Park			○	○	○	○	○	$30,000
Laguna Canyon Road Median Rehabilitation and Relandscaping			●		●			$750,000
Circle Way Storm Drain Supplemental Funding 2			●		●			$500,000
Shaws Cove lift Station					●			$1,400,000
Laguna Canyon Channel Rehabilitation			●		●			$900,000
Hillcrest Drive Drainage Improvements			●		●			$150,000
Animal Shelter Creek Erosion Protection Construction			●		●		○	$500,000
Circle Way Storm Drain Supplemental Funding 2			○		●			$500,000

● direct benefit
○ indirect benefit

7.3 Major Water Related Objectives and Conflicts

In addition to presenting the multiple regional planning objectives for the Newport Bay area it is important to understand how those objectives are integrated and how conflicts associated with those objectives might arise. This section presents some of the potential conflicts associated with regional planning as it pertains to the strategies outlined in this WMP. A number of water-related objectives are identified in this section (Table 7-4). Associated with the objectives are the conflicts or constraints which might influence the outcome of the stated objectives. In most cases the key constraint is imposed by cost benefit.

Table 7-4: Objectives and Conflicts.

Objectives	Conflicts
Promoting science-based study and methodology for characterizing environmental and water quality conditions.	Cost benefit budget constraints
Identify issues and concerns in the watershed.	Consensus on magnitude of issue, prioritization challenges.
Identify actions to address each issue and concern.	Actions may contradict existing plans or policies. Cross boundary issues.
Raise awareness of the public	Consensus on message
Promote public participation.	Communication
Developing an effective method to meeting regulatory requirements.	Some may perceive implementation projects as going "above and beyond" the requirements of the plan – added expense.
Increasing the health of the watershed.	May involve changing land use plan/ development
Reversing degradation of the watershed.	Cost may exceed benefit

8.0 PRIORITIES AND SCHEDULE

Specific project scheduling was presented in Section 6.0 and was based on a variety of issues including:

- Appropriate phasing for parallel or serial projects (e.g., special studies followed by structural BMPs)
- Resource allocation: including funding, staff availability, etc.
- Cost to benefit relationships
- Access and land ownership constraints
- Time frame expectations
- Measurable benefit expectations
- Expectations from the public

The schedules identify projects for the next fifteen years with some actions implemented immediately (it should be noted that some are currently underway) while others will have to wait for a later phase of works. The following factors should be considered and may affect how quickly a priority action can be implemented:

- Administration and Staff availability
- Funding
- Cost to benefit relationship
- Access and land ownership constraints
- Time frame expectations
- Measurable benefit expectations
- Expectations from the public
- Changes in the regulatory laws or programs
- Legal issues
- Technology

8.1 Adaptive Management

An adaptive management approach is recommended for future plan revisions and project implementation. There are six sequential steps in adaptive management. In watershed management, failing to collect or validate information developed in each step can lead to judgmental error since a decision or judgment may be based upon inaccurate information. Such judgmental error may lead to efforts, studies, and projects that do not address the original issue or concern or do not deliver the originally intended result. The six sequential steps include:

- Identification of the issue, concern, or management goal or objective
- Design of the management action or implementation plan
- Implementation
- Monitoring of management results
- Evaluation of the results relative to the desired management goal or objective
- Adjustment of management actions

If the outcome of a management action does not address the original issue, concern or management goal or objective, then the original assumptions and plan should reviewed.

This WMP should be reviewed by the WMAC every five years to determine if any revisions should be made.

8.2 Regional Priorities

A number of regional priorities have been identified. These priorities form a necessary part of the WMP in that its overall success involves the active co-operation of surrounding watersheds.

Some of the priorities identified in this plan include:

- Regulatory compliance
- TMDL implementation compliance
- Pollutant reduction
- Improve water quality
- Integrate environmental management program (recycling, stormwater management, water conservation, etc.)
- Increase public participation

8.3 Short-Term and Long-Term Priorities

In order to effectively implement this WMP, actions require prioritization. This section presents the short term and long term priority implementation strategy of the WMP.

Short-term priorities (1-5 years):

- Facilitate regional acceptance of the Newport WMP
- Identify contaminants of concern
- Identify areas of concern
- Identify sources of contaminants
- Identify potential funding sources for specific projects

- Conduct special studies to better understand the watershed and ASBS
- Implement first phase of BMPs (as outlined in Section 5.0)
- Develop and implement monitoring programs
- Assess effectiveness of BMPs through BMP monitoring program
- Develop adaptive management strategies for Tier 1,2 and 3 BMP efforts

Long-term priorities (5-15 years):

- Improve water quality in the creeks, rivers and marine environment of the Newport watershed
- Develop assessment of BMP effectiveness that can be implemented throughout the watershed
- Sustainable Ecology

8.4 Implementation Assessment

Assessment of actions and activities implemented under this WMP will be measured through a combination of methods. The information from the measurement methods listed below will be combined in a weight of evidence approach which provides value to all available information when conducting an assessment (Table 8-1).

Table 8-1: Assessment of Project Goals, Outcomes, Methods and Targets.

Project Goals	Desired Outcomes	Measurement Tools and Methods	Targets
Prevent fires	Eliminate the risk of fire	Fire presence/absence	No uncontrolled fires in the developed Newport Coastal watershed.
Improve Water Quality	Meet Water Quality Standards	Water, Sediment, Biological, Toxicity, Assessments	No water quality objective exceedances, meet all beneficial use designations.
Address Canyon Modifications, Erosion, and Sediment Control	Stabile Hillsides, Creek Banks, and Channels	Hydrology, Flow, Water Quality and Biological Monitoring	Minimal Erosion of Hillsides, Pre-Development Hydrology, Reduced Streambed Scouring
Protect Areas of Special Biological Significance	Minimized Physical, Chemical, and Biological Impacts	Biological Assessments, ASBS User Surveys	Increased Biological Richness, Reduced Exotic Species, Increased Awareness
Manage Habitat and Biological Resources	Minimized Physical and Biological Impacts	Biological Survey	Reduced Exotic Species, Presence or Restoration of Sensitive Species, Reduced Canyon Fire Frequency and Magnitude
Water Conservation/ Protect Water Supply	Reduced Potable Water Use, Beneficial Groundwater Use	Water Quality and Flow Monitoring	Reduced Stream and Creek Flows from Dry Weather Urban Runoff, Increased Installation of Automated Irrigation Controllers, Ground Water Extraction Well Installation
Enhance Community Resources	Increased Use and Access to Community Resources, Increased Awareness of Resources	Use Survey, Questionnaires	Improved Access to Beaches and Canyons, Reduced Impact to ASBS

8.4.1 Response to Regional Changes

It is expected that regional changes in planning, regulations, technology, and community needs and desires will play a role in the implementation of projects. The WMAC is progressive and proactive in nature and will likely foresee changes and prepare for them. In order to effectively implement this WMP in an environment of regional changes, the WMAC will revisit the vision, goals, objectives, issues/concerns, and actions determining if any revisions are necessary. Any revisions to the WMP will involve opportunity for public input and involve a plan to reintroduce the WMP with it revisions to garner an understanding, iterate the vision, and refocus the WMAC and community efforts.

8.4.2 Response to Implementation of Projects

Projects implemented to address issues and concerns may meet, exceed, or possibly may not fulfill original expectations. Each project will be reviewed to determine if the desired outcomes and targets are met. If the desired outcomes are not met, then an adaptive management approach will be initiated to determine the cause.

An adaptive management approach is recommended for future plan revisions and project implementation. There are six sequential steps in adaptive management. In watershed management, failing to collect or validate information developed in each step can lead to judgmental error since a decision or judgment may be based upon inaccurate information. Such judgmental error may lead to efforts, studies, and projects that do not address the original issue or concern or do not deliver the originally intended result. The six sequential steps include:

- identification of the issue, concern, or management goal or objective
- design of the management action or implementation plan
- implementation
- monitoring of management results
- evaluation of the results relative to the desired management goal or objective
- adjustment of management actions.

If the outcome of a management action does not address the original issue, concern or management goal or objective, then the original assumptions and plan should reviewed.

8.4.3 Alteration of Project Sequencing

Planning, CEQA, technical and financial factors will likely be the greatest factors affecting project sequencing. Other factors influencing project sequencing may include stakeholder buy-in, policy change and funding availability.

Any changes or revisions to the proposed sequencing and scheduling of projects will be communicated through WMAC meetings.

9.0 IMPLEMENTATION OF PLAN

This section presents the proposed implementation approach and schedule for the WMP. It also presents the roles and responsibilities of stakeholders in the implementation of this plan.

9.1 Implementation Schedule

The WMP will be formally implemented immediately after adoption which is expected to occur in 2008. Scheduling of WMP projects was provided in Section 6.0. Projects were scheduled from 2006 through 2015 with the majority of itemized projects occurring in the first five years. These initial projects are generally aimed at source control/pollution prevention measures and lower impact BMP implementation efforts. Combined with these management actions, effectiveness assessment actions will be employed in order to gather information to refine previously implemented actions or direct future implementation strategies. The latter phase of these works will be dependant on the adaptive management strategies employed and directed by effectiveness assessments of early implementation efforts, community and stakeholder participation, future regulatory changes, and other watershed assessment efforts.

9.2 Implementation Responsibilities

Responsibility of project implementation under this WMP will fall on the groups below listed with a Lead role. Each project will identify the appropriate lead group, and it is possible that lead groups identified below implement all, none, or some of the implementation projects. Groups with a lead role are eligible to apply for grant funding and contract work, if necessary. Other roles that will be equally important and contribute to the overall success of project implementation will include advisory, participant, and reviewers. A summary of groups and project roles are summarized below (Figure 9-1).

Figure 9-1: Expected Group Roles Under Project Implementation.

9.3 Implementation Linkages

The implementation of the WMP, in addition to identifying phased efforts and responsibilities, needs to identify linkages within the watershed and with the surrounding region. These linkages allow for optimal implementation while ensuring that efforts are not duplicated or omitted.

The following optimal linkages would ensure maximum benefit from the implementation of the plan:

- Ensuring that up-gradient and down-gradient projects are fully understood and communicated;
- Ensuring that projects and regulations outside of the Newport watershed are fully understood and coordinated;
- Ensuring that adjacent projects are coordinated and optimized to the maximum extent practicable.

9.4 Economic and Technical Feasibility

Implementation projects in this WMP and revisions to the plan are within current economic and technical constraints. The proposed projects can be planned, designed, implemented, managed, monitored, and reported by the City of Newport Beach, its partners, and numerous local technical consulting firms specializing in engineering, outreach, and environmental assessments and monitoring.

Technical
Many of these firms have a long history of collaborative working relationships which provides for greater capacity to conduct and implement complicated projects, such as integrating projects and the findings of watershed, harbor, and ASBS monitoring. The WMAC contains technical staff, some with professional certifications, who can also draft cost estimates based upon technical specifications.

Economic
The current and forward-looking economic climate of California and the City of Newport Beach looks positive. The City of Newport Beach General Fund will be able to continue funding the current staffing positions to manage the implement this WMP and coordinate other watershed issues. Current state and federal grant programs administered by the SWRCB and recent approval of several environmental bond measures by California voters provides funding opportunities over the next 1-5 years.

The City of Newport Beach has applied for many environmental grants from the SWRCB and despite the competition throughout the state has successfully been selected for funding on many of its grant applications. The City of Newport Beach and WMAC will look to grant funding as the primary funding source for implementation projects and will use its staff, equipment, and existing programs as match funds, if grant guidelines require a percentage of matching funds.

9.5 Institutional Structure

The current institutional structure of the City of Newport Beach which will be the primary group leading implementation of this WMP is presented below (Figure 9-2).

The Public Works Department of the City of Newport Beach has been leading the NPDES stormwater compliance efforts and implementation of projects to assess the water quality of dry weather flows and stormwater runoff in the coastal canyons and ASBS. In addition, the City Public Works Department has planned, constructed, and operated several water quality improvement projects.

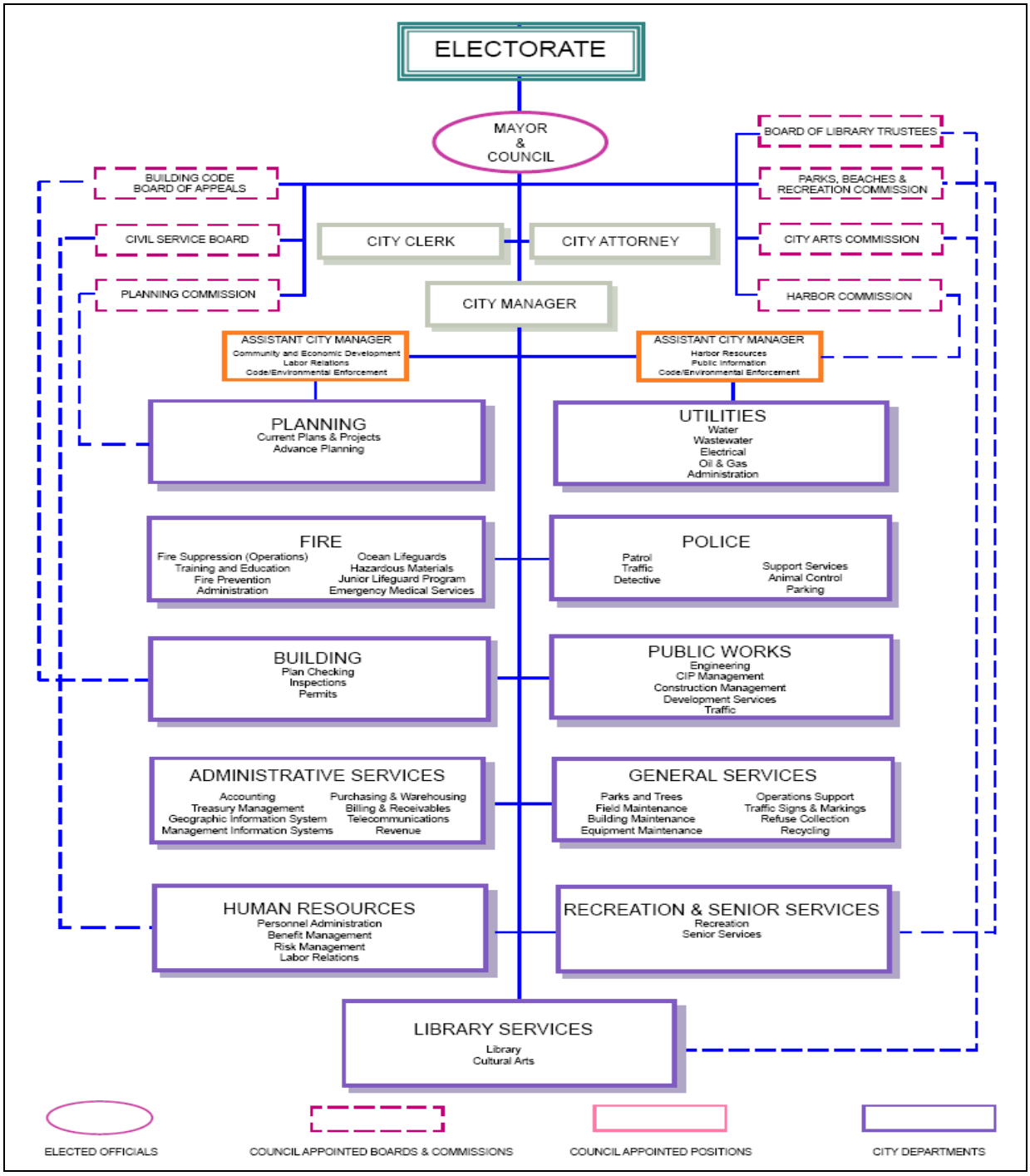

Figure 9-2: Institutional Structure of City of Newport Beach.

10.0 IMPACTS AND REGIONAL BENEFITS

10.1 Benefits of Regional Plan

The watershed existing conditions summary and priority implementation goals and objectives were produced by an inclusive process and developed by the community. The regional planning effort aims to eliminate planning, political, and economic boundaries so that these traditional boundaries do not, in any way, contribute negatively to or inhibit a watershed plan activity from being successful and effective at addressing an identified issue or concern. In addition, the WMAC hopes the Newport WMP will be used by other watershed management committees to produce a similar plan that includes strategies of restoration, enhancement, and protection.

This effort to develop a regional plan for the Newport Watershed aims to incorporate and address issues, concerns, goals, and objectives in the following plans identified below. The additional benefits of a regional plan includes raising awareness to other groups who may be able to provide assistance, leveraging existing efforts and resources, and establishing relationships through meetings, correspondence, and projects.

Table 10-1: Overview of Associated Planning Documents.

Agency	Planning Document	Description
City of Newport Beach	City of Newport Beach Municipal Storm Water Program Local Implementation Plan	The City's guidance document that describes how the City will comply with municipal stormwater regulations and urban runoff water quality. This includes information about outreach, enforcement, planning, BMPs, monitoring and administration.
City of Newport Beach	Newport Coast Watershed Program	A stakeholder driven guidance document and plan to address watershed issues from Buck Gully to Morro Canyon.
City of Laguna Beach	City of Laguna Beach Municipal Storm Water Program Local Implementation Plan	The City's guidance document that describes how the City will comply with municipal stormwater regulations and urban runoff water quality. This includes information about outreach, enforcement, planning, BMPs, monitoring and administration.
City of Newport Beach	Integrated Coastal Watershed Management Plan	Integrates the habitat, water quality, and water supply elements, goals and objectives of the approved watershed management plans for Newport and Laguna Beach in an effort to better preserve and restore the ASBSs and CCA's.
Santa Ana Regional Water Quality Control Board	Water Control Plan for the Santa Ana Basin (Basin Plan)	Designates beneficial uses, sets water quality objectives, describes programs implemented to ensure compliance, establishes enforcement mechanisms.
County of Orange	Orange County Storm Water Drainage Area Management Plan.	Provides foundational planning information to help the municipalities develop local implementation plans.

10.2 Evaluation of Potential Negative Impacts within the Region

Potential negative impacts that may be caused by implementation of this plan will be identified during a process know as the California Environmental Quality Acts (CEQA). CEQA is a State of California requirement that mandates each agency or group review, through a public process, all environmental impacts (including categories such as aesthetics / views, air quality, water quality, transportation, etc.) of all non-exempt projects. As a municipal permitting agency that funds or approves a project, the City of Newport Beach would be required to ensure that an approved CEQA document is provided with all project reviews. There are three types of CEQA documents: negative declaration (no impacts), mitigated negative declaration (impact though mitigation offsets), and an Environmental Impact Report, EIR, (some non-mitigable impacts)

10.3 Interregional Benefits

This plan is being developed using widely accepted watershed management principles and practices such as raising awareness, assessing and identifying issues and concerns, establishing goals, objectives, and actions, minimizing and reducing factors that cause issues and concerns, and implementing projects that compensate or mitigate the factors causing issues and concerns. In addition, the monitoring activities implemented under this WMP are intended to document real changes effected by implementation of actions. In addition, an adaptive management process that reviews incremental increases in information and understanding guides informed decision making. The WMAC will assist other regions by sharing the Newport WMP and will review other WMP in an effort to learn new approaches, perspectives, and actions.

The SWRCB recently required municipalities and institutions that discharge stormwater to ASBS to comply with ASBS regulations or submit an exception letter documenting prescriptive monitoring and reporting requirements. The City of Newport Beach will be hosting and facilitating several meetings during 2007 and beyond, each subsequent meeting building upon the previous, to raise awareness and develop additional strategies for complying with ASBS. Municipalities will be required to integrate general planning, operations and maintenance activities, stormwater compliance, watershed planning, and ASBS management.

10.4 Benefit to Disadvantaged Communities

The beaches, opens spaces, and public areas in the City of Newport Beach are open to the public and are visited by non-residences from throughout local cities and counties, California, and visitors from across the United States and abroad. The ASBS provide educational opportunities for inter-city schools in southern California. The benefits reach far beyond the community and into the common public areas accessible by individuals from disadvantaged communities who may travel to these public areas including parks and open spaces, beaches, and intertidal areas. These common areas are open to the public for recreational, bathing, and fishing opportunities and would be enhanced by the proposed activities for use by everyone those who recreate, swim, fish, and explore in the coastal area.

The communities closest to Newport Coast are not disadvantaged. However, Little Corona, Crystal Cove, Heisler Park and other tide pool areas are locations where students, parents and teachers come from across Los Angeles, Riverside, San Bernardino and Orange counties to see

the rocky intertidal areas. As one example, more than 10,000 students from the region attend docent-led tours of Little Corona. The City underwrites a significant percentage of the actual cost to conduct the docent tours.

10.5 Impacts and Benefits to Other Resources

The foreseeable impacts and benefits to other resources are difficult to determine at the time this WMP is finalized. The impacts and benefits to other resources will be documented during the CEQA process, if any.

11.0 TECHNICAL ANALYSIS AND PLAN PERFORMANCE

This section presents an assessment of technical aspects and plan performance measures which include data management requirements and gap analyses.

11.1 Data, Technical Methods, and Analyses Used to Determine Water Management Strategies

Water quality samples collected and analyzed under laboratory quality control have been and will continue to be used for the purpose of technical analysis and plan performance. Data of questionable quality will be qualified as such or removed from any technical analysis, so that misinformation is not created during data analysis. Data analysis will include methods to determine if discernable and statistical differences exist for temporal and spatial sampling programs. These temporal and spatial differences will determine reductions in pollutants related to project implementation and show reductions in pollutants over time. Reductions in pollutants temporally and spatially will show that the following implementation project types are effective: assessments, source control, pollutant prevention, and treatment (See Section 4.0).

11.2 Data Gaps

Several studies of water quality, ground water, and ecological assessments completed in the past are identified in the Existing Conditions Section 2.0. Assessments and studies is one of the major project categories identified in the Implementation Goals and Objectives Section 4.0. In addition, the Implementation Assessment Section 8.4 discusses an adaptive management strategy for reviewing project data and making informed decisions.

Any data gaps that currently exist or are discovered in the future will be filled, if necessary, before moving an implementation project forward. Filling the data gap(s) will provide the information necessary to validate assumptions and models, set-up future assessments which will capture more complete data, and provide a better foundation for tracking implementation project effectiveness.

11.3 Measures to Evaluate Plan Performance

Plan performance will be measured by determining the number of goals and objectives accomplished and by reviewing each implementation project and its targets as summarized in the Implementation Assessment (Section 8.4). When the WMP undergoes revisions, the WMAC will review the individual projects implemented under the WMP. The improvements in water quality of streams and the ASBS, the increase in watershed awareness, and the condition of ecological areas, to name a few, will be reported and included in the revised WMP.

Watershed plan performance data will be tracked in a variety of public, non-proprietary databases so that plan and project information can be easily queried. Water quality data will be kept in Surface Water Ambient Monitoring Program (SWAMP) compatible database when applicable and biological data will be incorporated into a SWAMP compatible database when biological SWAMP guidelines are published in the future.

11.3.1 Mechanisms for Adapting Project Operations and Plan Implementation

The WMP implementation projects will be adapted when administrative, budget, schedule, or other factors present constraints to the original project plan. The WMAC meetings provide a forum to discuss adapting implementation projects and plan implementation. In addition, the Newport Beach City Council will be the ultimate authority approving the City of Newport Beach staff to implement the WMP. Both forums provide a pre-meeting public notification, public comment period, ability to provide absentee written comments, and ability to provide technical presentations.

12.0 INFORMATION MANAGEMENT

12.1 Data System Development and Management

Land use and development is a formidable agent of change, shaping the distribution of land cover and affecting fundamental ecological processes. Decisions governing these land-use changes occur at the federal, state, and local level, and as a result, they are made at many different locations and times. Consequently, it imperative that an information and management system is design to provide needed scientific support for all levels of decision making (e.g., developers, planners, politicians, land owners, environmental activist, etc.)

Gathering and organizing data is a major component of developing a successful watershed plan. An information management program will be implemented designed to collect, store, and report data. The support and infrastructure system shall include adequate capacity to track, store, and retrieve data in a manner that is controlled for quality throughout the process. In additions all data collected and stored will be compatible with SWAMP. The intent of SWAMP is to "integrate existing water quality monitoring activities of the State Water Resources Control Board and the Regional Water Quality Control Boards, and to coordinate with other monitoring programs." This ensures that certain standards amongst sampling programs are consistent so that data generated from different programs can be correlated and compared to one another.

Another aspect in a watershed-wide information management program is the built-in foresight and flexibility needed to address future Water Quality and BMP effectiveness Monitoring Data. This can be addressed through the implementation of relational databases, which provide elaborate data queries and filtering capabilities that allow a user to extract information in an efficient manner, as well as providing a platform for exploring data analysis.

It is also important to address that land use and development is formidable agent of change, shaping the distribution of land cover and affecting fundamental ecological processes. Decisions governing these land-use changes occur at the federal, state, and local level, and as a result, they are made at many different locations and times. Consequently, it imperative that an information and management system is design to provide needed scientific support for all levels of decision making (e.g., developers, planners, land owners, environmental groups, etc.). Therefore, it is recommended that a data sub-workgroup or oversight committee is established to efficiently compile, integrate, and display all data under established QA/QC measures to ensure efficient and effective communication and decision making for all Newport Watershed Objectives.

12.2 Public Display of Data

Creating ease of access of all watershed programs and subsequent data ensures community involvement and cooperation between governmental agencies. Through the current and future technology of websites and data browsers, the public, stakeholders, and regulators can query data to assist in decision making and management objectives. In addition, water quality monitoring data can be queried and displayed, which is a valuable to in ensuring the success of the watershed monitoring plan.

12.3 GIS Display of Spatial Data

GIS (Geographical Information Systems) is a dynamic tool used to support data compilation and analysis. Through the creation of watershed maps, a variety of spatial information can be compared and evaluated, which is an effective form of communication to a variety of stakeholders and interest groups. The use of GIS will be a fundamental support in the further characterization of the Newport Watershed. It will create flexibility in understanding and balancing both current and future land use and water quality management. Using water quality data analysis in conjunction with GIS evaluations will provide an ongoing basis for evaluating water quality trends throughout the watershed.

13.0 FINANCING

13.1 Implementation Funding

Existing staff at the City of Newport Beach will provide the administrative support to champion the implementation of this WMP. The City of Newport Beach has planned for and will be the leader to implement this watershed plan for the next five years. Though in the future, it may deem appropriate to pass the leadership role and administration of this WMP to another community group or watershed council.

13.1.1 Potential Funding/Financing for Plan Implementation

Funding to implement action items in this WMP may be provided by one or more of the following sources:

- City of Newport Beach General Funds
- Donations from private citizens and businesses including estates and trusts
- State and Federal Grants (such as those under Prop 50, Prop 84, MMS, CBI etc)
- Private grants including easements and access rights
- Municipal bonds
- State and/or federal appropriations

Potential funding sources are also presented in Table 13-1.

13.1.2 Implementation Beneficiaries

With the approval and adoption of this WMP and all activities included to help improve water quality, establish a sustainable ecosystem, and provide for community necessities, the following beneficiaries have been identified:

- Residents and Citizens of Newport Beach
- Governmental Organizations
- Community Groups
- Project Partners
- Local and Transient Tourists
- Fisheries Companies
- Local Shops and Restaurants
- Public and Private Schools and Universities
- Aquatic Organisms
- Areas of Special Biological Significance (ASBS)
- Terrestrial Organisms

Table 13-1: Potential Funding Sources

Funding Group	Agency/Program	Purpose	Eligible Entities	Match	Contact/Info
Water Quality Improvement	State Water Resources Control Board – Watershed Protection Program (Proposition 13)	Reduce chronic flooding problems using nonstructural methods, support beneficial groundwater recharge capabilities, prevent sediment inputs to surface waters, implement projects consistent with local watershed management plans	Municipalities, local agencies, nonprofit organizations	No	State Water Resources Control Board
	State Water Resources Control Board – Coastal Nonpoint Source Program (Proposition 13)	Improve water quality in ground water, at public beaches, and in coastal waters through monitoring and pollution reduction actions	Municipalities, local agencies, educational institutions, nonprofit organizations	Yes, for capital costs	State Water Resources Control Board
	"California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002" (Proposition 40)	Clean beaches, watershed protection and water quality projects.	Public agencies and nonprofit organizations	Details not yet available	State of California (Details not yet available)
	State Water Resources Control Board – Water Quality Planning grant Program CWA Section 319(h)	Projects to improve water quality that is impaired or threatened by non-point source pollution.	State and local agencies, and nonprofits	Yes	Division of Water Quality, SWRCB, Lauma Jurkevics 916-341-5498; www.swrcb.ca.gov/nps
	USEPA -The Wetland Program Development Grants (WPDGs),	Projects that promote the coordination and acceleration of research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution.	State, tribal and local governments	Yes	USEPA, Cheryl McGovern 415-972-3415
	State Water Resources control Board – Clean Beaches Initiative	Project implementation to reduce health risks and increase the public's access to clean beaches.	Public agencies and nonprofits	Yes	Robin McCraw, State Water Board Clean Beaches Coordinator (916) 341-5547.
Habitat Restoration or Enhancement	State Water Resources Control Board – Watershed Protection Program (Proposition 13)	Protect and enhance greenbelts and riparian and wetlands habitats; restore or improve habitat for aquatic or terrestrial species.	Municipalities, local agencies, nonprofit organizations	No	State Water Resources Control Board
	California Department of Water Resources – Flood Protection Corridor Program (Proposition 13)	Acquire, restore, enhance, and protect real property for the purposes of flood control protection, agricultural land preservation, and wildlife habitat protection utilizing nonstructural approaches to flood management.	Public agencies, nonprofit organizations, Department of Water Resources	--	Flood Protection Corridor Program or California Department of Water Resources, Earle Cummings, 916-653-8912, earlec@water.ca.gov
	California Department of Water Resources – Urban Streams Restoration Program (Proposition 13, Proposition 40 for FY 2003/04)	Address flooding and erosion, and restore environmental values on urban streams and encourage cleanups, re-vegetation, and land acquisition in the floodplain to promote community stewardship.	Local agencies, nonprofit organizations, local community conservation corps Emphasis: Flood protection and management	Yes	Urban Streams Restoration Program or California Department of Water Resources, Division of Planning and Local Assistance, 916-327-1617, sdenzler@water.ca.gov
	California Department of Parks and Recreation – Riparian/Riverine Habitats Program (Proposition 12)	To improve or acquire and restore riparian habitat, riverine aquatic habitat, and other lands near rivers and streams for river and stream trail projects.	Cities, counties, districts, local agencies formed for park purposes, other districts, and federally recognized California Indian tribes	--	Riparian/Riverine Habitats Program or California Department of Parks and Recreation, Dave Smith, 916-651-8576, dsmith@parks.ca.gov

Table 13-1: Continued.

Funding Group	Agency/Program	Purpose	Eligible Entities	Match	Contact/Info
	California Department of Parks and Recreation – Habitat Conservation Fund	Acquire, restore, and enhance wildlife habitat and significant natural areas including riparian and wetlands areas.	Local agencies and districts	Yes	Habitat Conservation Fund or California State parks Office of Grants & Local Services, 916-653-7423, localservices@parks.ca.gov
	State Coastal Conservancy – Southern California Wetlands Recovery Project	Acquire, preserve, restore, or enhance wetland/riparian areas along the coast or associated with coastal watersheds.	Public or private groups	Preferred but not required	Southern California Wetlands Recovery Project or California Coastal Conservancy, Trish Chapman, 510-286-0749, tchapman@scc.ca.gov
Plan Development	State Water Resources Control Board – Water Quality Planning grant Program CWA Section 205(j)	Fund water quality planning and assessment activities aimed at reducing or preventing pollution to ground and surface waters, or restoring polluted water bodies or watersheds; includes developments of best management practices or Total Maximum Daily Loads, development of watershed management plans or recovery plans, needs analysis.	State, and local agencies, and nonprofits	Yes	State Water Resources Control Board, Paul Lillebo 910-341-5551; www.swrcb.ca.gov/nps
	California Wildlife Conservation Board – Natural Heritage Preservation Tax Credit Program	Provide tax credits to private landowners interested in donating qualified lands to state resource departments, local governmental entities, and qualified nonprofit organizations for conservation purposes.	Private landowners	--	Natural Heritage Preservation Tax Credit Program or Wildlife Conservation Board, 916-445-8448
Monitoring	State Water Resources Control Board – Watershed Protection Program (Proposition 13)	Monitor the water quality conditions and assess the environmental health of the watershed consistent with local watershed management plans.	Municipalities, local agencies, nonprofit organizations	No	State Water Resources Control Board
	State Water Resources Control Board – Nonpoint Source Implementation Grant Program CWA Section 319(h)	Water quality monitoring to promote citizen monitoring; monitoring to determine effectiveness of management practices and extent of water quality improvement.	Local agencies, special districts, nonprofit organizations, educational institutions, Indian tribes	Yes	State Water Resources Control Board
	California Conservation Corps (CCC)	Citizen monitoring, erosion control studies, environmental mitigation projects, park maintenance and restoration. Project must provide a natural resource or other public benefit and provide corps members with education and training in employable skills.	Federal and state agencies, local governments, non-profit organizations, school districts, and private industry		Walt Auburn or Margaret Behan: 916-341-3100 or 800-952-5627
	U.S. Environmental Protection Agency (USEPA), Environmental Monitoring for Public Access and Community Tracking (EMPACT)	To provide public access to clearly-communicated, time-relevant, useful, and accurate environmental monitoring data in an ongoing and sustainable manner in major U.S. metropolitan areas.		Yes	EMPACT or USEPA, Office of Strategic Planning and Emerging Issues, Wienke Tax, 520-622-1622, tax.wienke@epa.gov

Source: Shirley Birosik, RWQCB-Los Angeles Region, 2001; Parsons 2002; SWRCB – Funding Sources (www.swrcb.ca.gov/nps/docs/cwarfp/ard.section_16.doc)

13.1.3 Ongoing Support and Financing for Operation and Maintenance

The implementation of this WMP will require ongoing and active operation and maintenance of programs and action identified herein. The operation and maintenance of water quality best management programs, trail maintenance, education and outreach, websites, telephone hotlines and voicemail, litter removal, and environmental docents to name a few will be funded by a collaborative effort by the following agencies, groups, and partners:

- City of Newport Beach
- Stormwater Co-permittees
- Surfrider Foundation - Newport Beach Chapter
- State of California Department of Parks
- Orange County Coastkeeper
- The Irvine Company Landowner
- Friends of the Newport Coast
- California Coastal Commission
- Irvine Ranch Water District

14.0 RELATION TO LOCAL PLANNING AND SUSTAINABILITY

Coordination among City departments represents a primary method to optimize staff resource efforts towards achieving watershed management objectives. In addition to accomplish effective regional planning, the City will need to ensure its local planning activities are consistent with planning activities in adjacent cities and county. Coordination already occurs among City departments. However, no oversight role presently exists for prioritizing actions or proposed projects. Therefore the creation of an "oversight" group is recommended. This group would represent a cross-section of interest groups and stakeholders who would coordinate and prioritize regional watershed management efforts. This cooperation would be cost effective by forming partnerships and deriving benefits from sharing and applying "lessons learned" among various entities and jurisdictions.

14.1 Relationship to Local Planning Documents

Vision:
The Newport WMP is inextricably linked to local planning documents such as the Newport Beach General Plan. Under the vision of the Newport Beach General Plan, protection of environmental quality is a high priority and includes preservation of open space, beaches, parks, preserves, harbor, and estuaries. The plan views ocean, bay, and estuaries as flourishing ecosystems with high water quality standards which in turn attract locals, tourists and other recreational users to its beaches and waterways.

Land Use Element:
As Newport Beach is almost fully developed, the land use element of the General Plan focuses on how population and employment growth can be accommodated and still preserve its distinguishing and valued qualities. It recognizes that most of the City will be conserved with its existing pattern of uses and establishes policies for their protection and long term maintenance.

The Newport Coast WMP is aligned with this policy in that many of the management strategies proposed target:

- Outreach and communication in existing communities and stakeholders.
- Management practices that target new construction
- Flow reduction measures within existing communities
- An integrated approach to resource management encompassing surrounding watersheds

Natural Resources Element:
The Natural Resources Element of the Newport General Plan requires consideration of:

- Water quality
- Air quality
- Biological resources
- Marine resources
- Mineral resources
- Energy conservation

Outlines of Newport's goals and policies should be adhered to in any watershed planning action implementation.

14.2 Coordination with Local Land-Use Decision Makers

Local land-use planning affords a great opportunity for protecting natural systems because local communities can develop land use plans that are proactive rather than reactive, thereby providing stewardship before restoration or mitigation is necessary (Karr, 1990). Such planning efforts can broaden approaches to encompass biotic communities and habitats and can offer a wide range of planning tools that incorporate the balance of regulatory mechanisms.

This WMP creates a system that supports local land-use decision making by providing credible and pertinent ecological data and analyses to planners, decision makers, and citizens.

This plan ensures that local planning documents of different municipalities do not conflict with one another and that projects that cross municipal boundaries can be effectively planned, approved, and managed.

14.3 Dynamic between Water Management Strategies and Local Planning

The watershed management strategies laid out in this plan contain dynamic and adaptive processes aligned with local planning. However, as local planning goals change or adjust to existing political pressures so too should the WMP. This will be facilitated through coordination with the WMAC and other key stakeholders.

15.0 PUBLIC PARTICIPATION

A vital component of any WMP is that contributed by the public. This section provides guidance to obtaining suitable public participation.

15.1 Stakeholders

The stakeholders listed below have played an important role in developing the implementation goals and objectives:

Jurisdictional Agencies
- California Coastal Commission
- Santa Ana Regional Water Quality Control Board
- Army Corps of Engineers
- California Department of Fish and Game
- California State Parks Department
- City of Newport Beach

Community Support Groups
- Orange County Surfrider Foundation
- Orange County Coastkeeper
- Friends of Newport Coast
- MiOcean

Cooperative Partners
- County of Orange Watershed and Coastal Resources Division
- The Irvine Company
- Irvine Ranch Water District

The City of Newport Beach continues to lead watershed management planning and implementation and continues to expand its scope into managing other environmental and regulatory issues. Specifically, the City of Newport Beach is managing Newport ASBSs, general ocean and marine issues, and possibly Newport Harbor TMDL's. The relationships and partnerships developed with these other environmental and regulatory issues will likely bring additional stakeholders to the WMAC.

15.1.1 Involvement in the Planning Process

Project planned under the purview of this WMP will be introduced and developed through WMAC meetings at which time stakeholders may provide feedback relating to the schedule, budget, technical requirements and review, monitoring, assessment, educational outreach, and funding.

15.2 Public Workshops

15.2.1 Previous stakeholder workshops

A stakeholder workshop was held on May 1, 2007 to provide an overview of special studies currently being undertaken in the ASBS as well as the proposed projects and the plans for moving them forward. The workshop was attended by 25 people from the following organizations:

- City of Newport Beach
- City of Laguna Beach
- Irvine Ranch Water District
- The State Water Board
- The US Army Corp of Engineers
- The Orange County Regional Board
- Fish and Wildlife Service
- California Coastal Commission
- California Dept of Fish and Game

Presentations were made by:

- Weston Solutions
- Cal State Fullerton
- CRM Inc.

15.2.2 Future workshops

Public workshops will serve as a forum for presenting new ideas, project updates, and soliciting feedback on plans and as projects develop. All public workshops will provide a predetermined amount of time, as necessary, for citizens to raise issues, comment, and provide commendation. Workshop participants may participate absentee by providing written comments in advance of the meeting. Every effort shall be made to provide agendas five working days in advance of the workshop, and agendas will be available at the City of Newport Beach display board of public meetings and the City of Newport Beach Website. Public workshop participation will be documented with a sign-in sheet. Those who also choose to provide contact information will be notified of future workshops. Meeting summaries will be created to provide an effective means for document workshop activities.

15.2.3 Partnerships Developed During the Planning Process

Partnerships developed through the planning process should be maintained during the implementation and assessment portion of the WMP. In this way, suitable feedback and guidance can be obtained when adjusted management practices are required.

15.3 Information Dissemination

A variety of information dissemination techniques can be used to further develop and gain acceptance around the WMP. These may include the use of websites, boards, email and mailings.

15.4 Potential Obstacles

A number of potential obstacles occasionally present during the final framing of a public document. These can include public dissention, disagreement, impasse as different groups or individuals contribute to the development process. Often these obstacles occur because of a perceived feeling that voices or opinions are not being heard. It is therefore important to develop a framework whereby everyone feels they can contribute effectively and that differing opinions can be resolved.

15.5 Environmental Justice and Disadvantaged Communities

Any communities in the City of Newport Beach designated as an environmental justice or disadvantaged community will be solicited for comments on implementation projects.

15.6 Coordination with State and Federal Agencies

In order to effectively communicate direction and changes to the State and Federal regulatory agencies it is necessary to provide regular notification and invitation of state and federal agencies.

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